

THE KINGSWAY SOCIAL GEOGRAPHIES

edited by ERNEST YOUNG



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RICULUM

Book III

THE CULTIVATORS



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BOOK III

THE CULTIVATORS



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THE KINGSWAY SOCIAL GEOGRAPHIES

Edited by ERNEST YOUNG, B.Sc.

BOOK III

THE CULTIVATORS

by

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Geography Master, County School, Harrow Weald

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PREFACE

THIS series of five books, of which this is Book III, is intended for use by pupils from the age of about eleven upwards and each book provides a course of work that should take about half the school year. The language throughout the five books has been kept as simple as possible.

The complete series covers the geography of the whole world, but it is not concerned with an excessive number of unrelated facts. By means of living races and present conditions it seeks to tell a continuous story of the evolution of culture. The material is, when suitable and available, taken mainly from different parts of the British Empire, but all the more important parts of the world as well as of the Empire are dealt with somewhere in the series.

The exercises are varied in difficulty in order that they may meet the needs of those different grades of ability that are usually to be found in one and the same class.

If geography is worth studying at all it is not for the accumulation of a mass of information, most of which will certainly be forgotten, and much of which may soon be out of date, but for the acquisition of a body of ideas that may leave some kind of permanent outlook upon life and its problems.

E. Y.

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The wheat harvest on an English farm.

[Will F. Taylor]

PART ONE: HOW AGRICULTURE BEGAN

CHAPTER I

GROWING THE FIRST CROPS

IN the first chapter of Book II of this series we have pointed out that some of the people who lived in the New Stone Age had learned to tame animals, others had learned to cultivate the ground, and others had learned to do both. We have already spoken of the herders: in this Book we shall deal with the cultivators.

We do not know, for certain, where or how agriculture first began, but it is possible that it was the wives of hunting tribes who grew the first crops. The men would go off for days together and leave their wives behind to look after the children. Sometimes the food that the men had brought them was all eaten before another supply arrived and the women had to eat nuts, berries, and seeds that they found near their homes.

Then, perhaps, by accident, they left the shoots of certain plants lying on the ground and found, later on, that the shoots had taken root. Or, perhaps, they let a few seeds fall on the ground and these sprang up and produced more seeds. In these, or other ways, the women may have learned that it was easier to plant shoots and seeds near the home and reap the harvests than it was to go out looking for them here and there. It is also likely that it was the women who found out how to grind seeds into meal that could be made into some kind of bread.

What we are certain about is that amongst tribes still living the rule is that if the tribe both grows grain and hunts it is the man who hunts and the woman who cultivates. We can feel

THE CULTIVATORS



[E.N.A.]

Kaffir women, with their hoes, in a field where they are growing maize.

pretty certain that woman was the first grain grower and to her the world, our world of to-day, owes a great deal.

If it had not been for her we might still be living on the birds and wild beasts that we could kill or the shell-fish, insects, wild roots, and seeds that we could collect. There are still people like the Bushmen in the Kalahari Desert of South Africa, or the natives of Australia, who know nothing of agriculture. They spend all their time chasing wild creatures and often go hungry for days because they have caught nothing. Others, like the Indians of Tierra del Fuego, who live largely on fish and shell-fish, can obtain their food more regularly, but even they must spend most of their time gathering it.

All through the Old Stone Age, which lasted for hundreds of thousands of years, men were nothing but hunters and, like all hunters, both of those days and these, were always destroying things.

As soon, however, as man learned to till the soil and grow

GROWING THE FIRST CROPS

crops for food he found that it helped him a great deal to think about his food supply beforehand and to depend on his own plans as well as on Nature's gifts. Herders and cultivators bred animals and grew crops so that their supplies of food became more plentiful year by year. Unlike the hunters, who were never sure of the next meal, the herders and cultivators did not often go hungry: they had, nearly always, plenty of food at hand.

They could also stay at home. Unlike the hunters and the collectors, who soon used up all the food in any district and were, therefore, for ever on the move, the cultivators could live in groups on a small piece of land. And because they lived together they could learn from each other. They became wiser.

Farmers are, to-day, the most important people in the world. In the first place there are millions more farmers than there are miners or workers in factories. In the next place they produce the food without which everybody would die.

EXERCISES

1. Why do hunting peoples often go hungry?
2. Why do they not settle in one place?
3. Why do cultivators seldom go hungry?
4. Why can they settle in one place?
5. Who probably was the first grain grower? Why?
6. Who are the most important workers in the world? Why?

CHAPTER 2

GROWING GRAIN IN SUNNY, BUT ALMOST RAINGLESS LANDS

AS we pointed out in the last chapter, we cannot say exactly where agriculture began. At the same time there are good reasons for believing that two of the lands where men first learned to grow grain were Egypt and Mesopotamia, or, as we now call the latter country, Iraq. Let us see what these reasons are.

1. If we think for a moment we shall see that grain must first have been cultivated where there were plants that produced wild grain to cultivate. The chief grains grown to-day are wheat, barley, oats, rice, and maize (Indian corn), and it seems only likely that one of these was the first that man cultivated for his own use. It is believed, for reasons that are too difficult to be given here, that wheat and barley were cultivated before any others and that wheat was cultivated before barley.

If this is true then we may suppose that agriculture began in that part of the world where some kind of barley and wheat grew wild, and it is believed that such grains probably grew wild in or near the regions mentioned above.

2. We know that most grains, particularly wheat, need a dry, sunny climate to ripen them and this is exactly the kind of climate that is found in Egypt and Iraq. In Egypt there is sometimes rain along the coast but very little rain falls farther inland. There is practically no rain at all in some parts of the valley of the Nile. Iraq, too, has very little rain and what there is falls after the harvests have been reaped.

All this is very important to the cultivator. He knows that whatever else may happen the weather will *always* be warm enough and dry enough to ripen his grain.

GROWING GRAIN IN SUNNY LANDS



Map showing the position of Egypt and Iraq. Land over 2,000 feet high is shown by diagonal shading.

3. The crops, however, need water some time or other. Without it the seeds would not grow. This water is provided by the rivers.

The Tigris and the Euphrates have their beginnings in some high mountains in the north. There, in the spring time, the snow on the mountains melts, there are heavy rains, and the rivers are full of water. Farther south, where the land is much lower, the rivers rise, overflow their banks, and bring water, just when it is needed, to the thirsty land. Without this flood water there could be very little growing of grain. Not far from the banks of the rivers, where the floods do not reach, there is a hot, barren desert where only wandering herdsmen can live.

THE CULTIVATORS

The same kind of thing, as we shall see in the next chapter, happens also in Egypt.

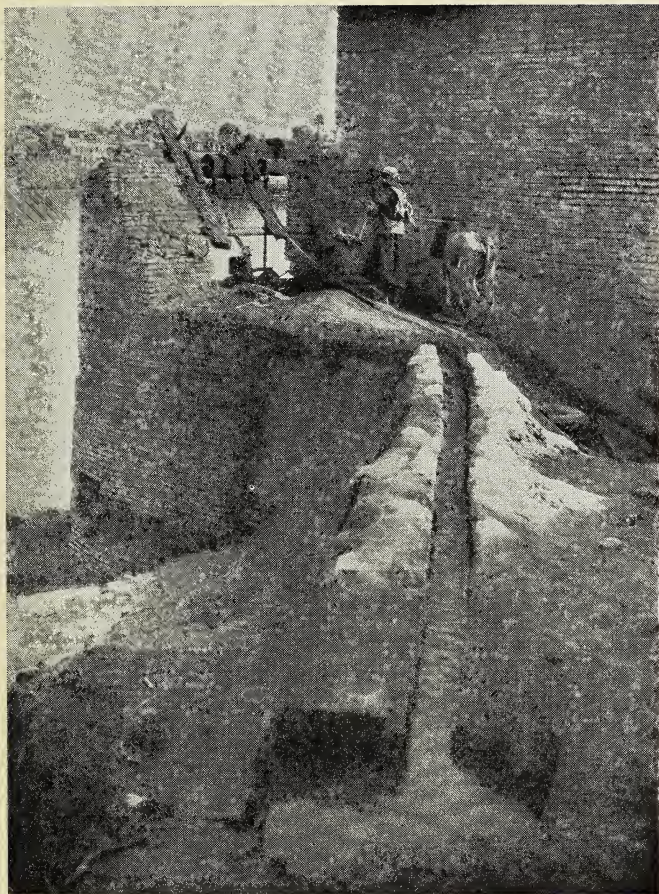
4. The floods bring something else besides water. They bring new soil. A growing plant obtains its food from the soil in which it grows. If the same crop is grown on the same ground, year after year, it will gradually use up all, or nearly all the food in that ground and there will be no crop, or a very poor one. The ground may be fertile enough to begin with, but it will end by not being fertile at all. One of the ways in which man keeps his fields fertile is to give them fresh food by means of manure or some other fertiliser. In the case of Egypt and Iraq, however, the floods save him a great deal of trouble in this matter. The flood water contains large quantities of mud brought from the highlands. This mud, called *silt*, gradually settles, and when the river falls again, it is left as a rich soil, full of new plant food, for the new crops.

These floods have been happening every year for thousands of years and, to-day, in the valley of the Nile, there are from thirty to sixty feet of fine soil.

5. We have said that when man began to grow grain he could be fairly sure of his food, could stay at home, and had more time in which to think out new plans. One of the things he must have noticed was that his seeds did not grow unless they had water at the right time, and one of the new plans he made was to carry water to places where the river would not carry it for him. He learned to imitate Nature and water the soil. In other words, he learned to *irrigate* the ground.

If we were travelling in Iraq to-day, we should see water being lifted from the river to the land, in ways that are thousands of years old. Here is one of them. Before us is a tall framework of wood. On it are a number of pulleys. Over the pulleys ropes are passed. At one end of such a rope a bag made of skin is tied. The other end of the rope is fastened to

GROWING GRAIN IN SUNNY LANDS



Lifting water from the river to the land in Iraq. [F. Kingdon Ward.]

THE CULTIVATORS

an ox. The ox walks towards the river and so lets the skin fall into the water. When it is full he walks away from the river and pulls the bag up. When the bag is high enough, the driver stops the ox, and tilts the bag so that the water runs out of it into a ditch. From the ditch the water runs to the garden or the field.

We shall see other ways of lifting water and irrigating the soil in the next chapter, when we speak more fully of Egypt.

EXERCISES

1. Give four good reasons why grain growing probably began in or near the valleys of the Nile, the Euphrates, and the Tigris.
2. Draw a map big enough to show the countries where these rivers flow. Put in and name the rivers and the countries.
3. Why is it necessary to put fertilisers on the ground where crops are grown?
4. What is the meaning of *irrigation*?

CHAPTER 3

THE EGYPTIANS

THE greater part of Egypt, as of Iraq, is a desert and the only fertile land lies either in a narrow strip along the banks of the Nile or else in the wide delta. The strip along the river banks is never more than ten miles wide and is, in places, not nearly so wide as that.

Each year, as already pointed out, the Nile rises and floods the land, bringing great quantities of silt that contain much plant food. This silt is, therefore, very fertile.

There is no cold weather. The summers are hot and the winters, if winters they can be called, are very mild. Many people go to Egypt in the winter time to escape the cold of their own countries and to be warm.

Because the soil is fertile and the climate never cold, fields can be cultivated all through the year, and three crops can be gathered every year from the same piece of ground.

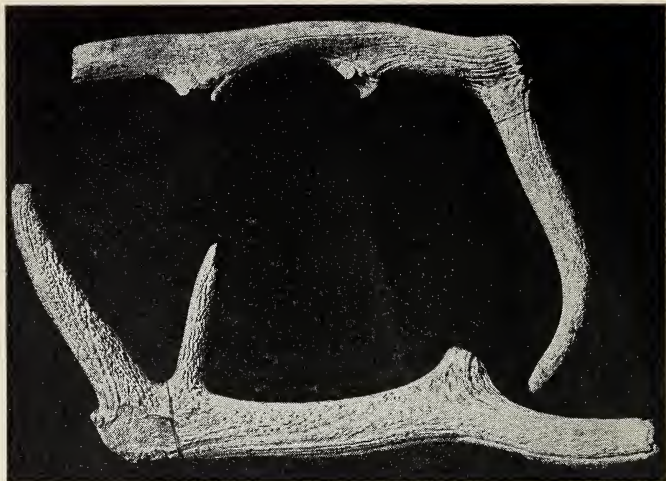
In the summer, April to August, the chief crops are cotton, sugar cane, maize, and rice. In the flood season, August to December, the chief crops are maize and rice. In the winter, December to April, the chief crops are wheat, barley, beans, and clover.

The ground is ploughed with a very simple kind of plough that has not changed its shape for many hundreds of years. Did the Egyptians, in their spare time, invent the plough?

The first tool that was used in agriculture was a *stick*. Sooner or later, however, somebody found out that it was easier to make holes in the ground or to break up the soil if a *pick* were used instead of a stick.

The first pick may have been the horn of a deer or just a piece

THE CULTIVATORS



Picks made from the horns of a deer.

[W. F. Mansell.]

of wood with a short bit sticking out at an angle. Right down to almost our own time such picks were used in Sweden, and such wooden picks are still in use in the island of New Caledonia in the Pacific Ocean.

It is not a long jump from the pick to the *hoe*. The blade of a true hoe is usually of shell, stone, or metal, but it may, at times, be of wood or bone. Cultivating the ground with a hoe is a very simple way of preparing the soil, but only the surface of the ground is moved. At the same time the hoe is a better tool than a pick, and once it had been invented it was possible to make more rapid progress in the cultivation of the soil. The hoe is still widely used in Europe, Asia, and Africa, but not so widely in other parts of the world.

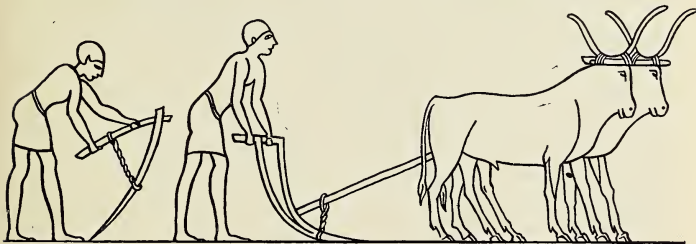
Now look at the drawing at the bottom of the next page.

THE EGYPTIANS

It is a copy of a very old picture of two men working in a field in Egypt. The man on the left has a hoe with which he is breaking up clods of earth. The man on the right is ploughing with oxen, but the plough is simply the hoe turned round. The hoe was the father of the plough.

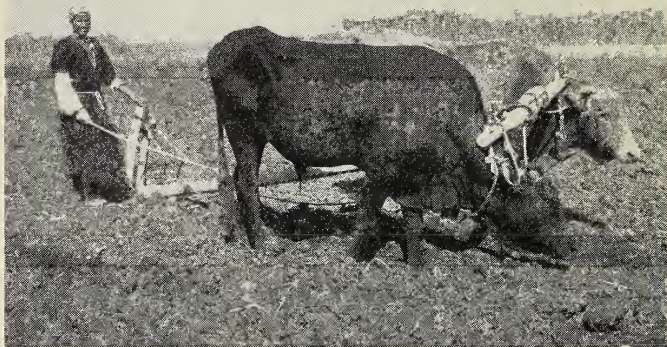
The simplest kind of plough, still used in Asia and North Africa, and even in one or two parts of Europe, is of wood, with only the cutting part of iron. Ploughs, as simple as these, were in use in the islands of the Hebrides not so very many years ago, and the native ploughs of Egypt, made entirely of wood, are to this day very much like them. The furrows cut by an Egyptian plough are not very deep and are very rough. This, however, is a very good thing. If the land were deeply and smoothly ploughed the heat of the blazing sun by day and the cold, dry air of the desert by night, would make the surface as hard as bricks.

As we have seen, the flooded ground is fertile and the climate is always warm. There ought, therefore, never to be any lack of food in Egypt and there never would be any lack of it if there were no trouble about the water. We have said that the peasant who tills the ground has to depend for water on the river. This is not quite so simple as it sounds. In the early autumn, when the river is in flood, there may be too



Copy of an old picture of two men working in a field in Egypt.

THE CULTIVATORS



An Egyptian farmer using a wooden plough drawn by oxen.

[E.N.A.]

much water; in the early summer, when the floods have gone down, there is always too little.

It is important to learn how, in times past and present, this difficulty about the water supply has been tackled. When the river rises the water is allowed to flow over the land, carrying with it the load of fertile silt. The fields are surrounded by dykes and form a number of basins in which the water can be kept till the silt has fallen to the bottom and the soil is well soaked. After about six weeks the dykes are opened and the water lying on the surface flows back into the river.

When the river is at its lowest point the water is, in places, as much as thirty or forty feet below the top of the banks. If the peasant wants to use it he must lift it.

Sometimes he lifts it with a *shaduf*. This consists of a pole with a leather bucket at one end and a heavy lump of Nile mud at the other. The bucket is pulled down by hand and

THE EGYPTIANS

filled with water. It is then raised by the mud weight and poured into a ditch or canal through which it flows to the fields. If the banks are very high there may be as many as three or four shadufs, one above the other, and the water must be raised three or four times before it can reach the thirsty fields.

Sometimes the *sakieh* is used. This is a heavy cogged wheel, turned by a bullock, a camel, or other animal. The cogged wheel turns another to which a number of earthenware jars are fastened and the water is lifted by means of these jars.

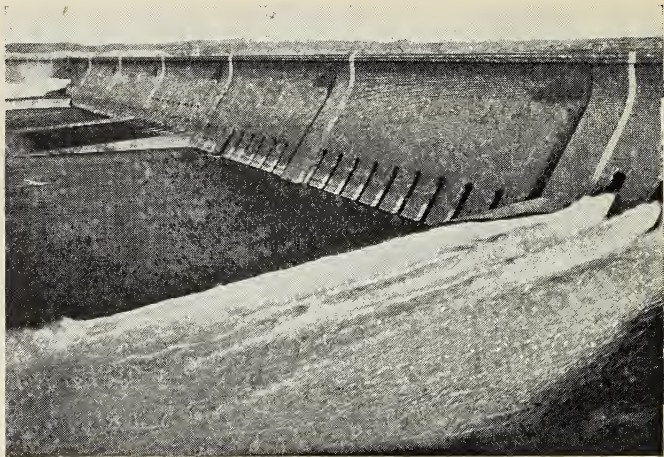
In the olden days, after the floods had gone down, many of the fields were left dry and nothing could be grown on them till the next year. Many years ago, however, a dam was built



Natives working shadufs to lift water from the river.

[E.N.A.]

THE CULTIVATORS



The great dam at Aswan

[E.N.A.]

across one part of the river to hold up the water in time of flood and prevent it running away. In the dam were little gates that could be opened in the summer to let the water flow into canals and so to the fields. In this way farming could go on all the year round.

Between 1900 and 1925 other dams were built, for the same purpose, by the British. The biggest of them is at Aswan. It is of solid granite and over a mile long. It holds up the water in the river for nearly two hundred miles. This water, when needed, is allowed to flow to the fields through canals. There are about 8,500 miles of large canals and 45,000 miles of smaller canals and ditches.

Irrigating the land was one of the most important inventions made in agriculture.

Egypt, as we shall see in the next chapter, was one of the

THE EGYPTIANS

earliest countries to become civilised, but the peasant still lives very much as he did thousands of years ago. His home is a hut, not made of trees because trees are few, but of mud, of which there is plenty in the river. The roof is flat; there is no need to make it slope in a land where there is so little rain. It is thatched with reeds and plastered with mud. There are no windows in order that the interior may be kept cool.

The furniture is not much more than a brazier to hold the cooking fire, water jars, a few pots and bowls of earthenware or copper, and one or two mats or stools.

Inside are often animals as well as people; these animals include the donkey, goat, sheep, chickens, and pigeons.

In the delta the huts that form villages are built close together to save ground. In the narrow valley, for the same reason, they are often strung out in a long row at the line where the yellow sands of the desert meet the green of the fertile fields.

EXERCISES

1. Draw a map big enough to show all the Nile and its tributaries. Put in Alexandria, Cairo, Khartoum.
2. What parts of the Nile valley are (a) high land, (b) low land?
3. Copy out the list of crops on p. 17.
4. Name all the kinds of ways, mentioned in this chapter, of irrigating the ground.

PART TWO : CIVILISATION BEGINS

CHAPTER 4

THE BEGINNINGS OF TRADE

LET us now see how the conditions in Egypt led to the beginnings of civilised life.

Because the Nile, every year, brought water and fertile silt to the fields, and the climate was always warm, many kinds of crops could be grown and the crops were nearly always abundant. There was plenty of *food*.

There was, in fact, as a rule, much more food than the people needed: there was food to export. In exchange for this food things were received from other countries. There was *trade*.

The profits on this trade went to the rulers of Egypt, who thus became very rich. They had, therefore, *leisure*, in which to think about arts and crafts.

To make the best use of these things the people needed to be free from foes from outside. Now the desert on the east and west of Egypt and the sea on the north kept the Nile valley safe from most enemies. Hence, for long periods of time, there was *peace*. Peace is specially needed in countries where there is irrigation and cultivation: any destruction of the channels that carry the water ruins the chances of the crops and, after war is over, it takes a long time to put the dams and channels in order again.

When the Nile overflowed its banks much of Egypt was like a great lake and there was the danger that houses, animals, and people might be drowned. The floods had to be controlled. Great dykes had to be built and canals had to be made. Such

THE BEGINNINGS OF TRADE

work needed large numbers of people. No man could do it by himself. People had to learn to work together to help each other. There was *co-operation*.

When the floods went down it was difficult to say where one farm ended and the other began. There were no hedges, fences, or trees that could be used as landmarks. In order, therefore, that a man might know exactly which land was his, maps of the fields had to be made. The Egyptians invented *surveying* and *map-making*. To do this they had to invent *geometry*.

In order to make full use of the floods and to avoid being drowned they had to know when the floods could be expected. Now some of them noticed that the floods came when certain stars stood in certain places in the sky. So they studied the stars, and the science known as *astronomy*, divided the year into three hundred and sixty-five days, and so made a *calendar*.

The men who best understood the stars were looked up to as very wise and powerful and became *priests*. They needed buildings from which they could watch the stars and the people built the first stone temples. The Egyptian *architects* were perhaps the first in the world to study building as a science.

By means of maps and stars it was possible to find the way across the sea, and six hundred years before Christ was born an Egyptian fleet sailed all round Africa. The Egyptians were *navigators*.

We have seen that the people had to combine to manage the floods. But when people combine they must have a leader, just as every football team has a captain. Moreover, someone had to see not only that the water was not wasted, but that everybody had his proper share, not too much nor too little. They had to agree to have *laws*: laws are the rules of the great game of living together. The man who was the captain had to see that the laws were obeyed. At first each small district looked after its own bit of the river, but in time powerful rulers

THE CULTIVATORS



Egyptian writing on stone.

[British Museum.]

brought more and more of the valley or the delta under their rule and became kings. At one time there were two kings, one for the valley and one for the delta, but finally both parts had but one sovereign. Thus the idea of an all-powerful *king* arose in Egypt.

To pay for the work of making dykes and canals and keeping them in repair, and to pay the ruler for keeping order and telling the rest of the people what to do, each person had to give something to the king. In ancient Egypt, therefore, the people learnt to pay *taxes*.

In order that the ruler might be able to let everybody know what were his wishes he had to send messages. The Egyptians made an alphabet and learned to read and write : people who can read and write have become civilised. But in order to send a written message there must be something on which to write. The Egyptians invented *paper*, which they made out of papyrus, a reed that grows on the banks of the Nile. In Iraq writing was done on dried mud and messages were enclosed in dried-mud envelopes.

THE BEGINNINGS OF TRADE

Because the food supply was regular and certain, people had more spare time and they began to take more interest in their tools, furniture, and clothes. Then one man was found to be, say, a better blacksmith than the rest. So he left off ploughing and made ploughs. In this kind of way there came about a much greater *division of labour*. There were potters, wood carvers, makers of jewellery, and builders, as well as kings, nobles, priests, soldiers, and merchants. Such people did not need to work in the fields and they gathered together in *towns*.

The most important town was the *capital*. The present



A dried-mud letter (left) and envelope from Iraq.

[British Museum.]

THE CULTIVATORS



The city of Cairo as it is to-day.

[E.N.A.]

capital, Cairo, is at the point where the valley and the delta meet, and Cairo, or some place near it, has always been the capital whenever the valley and the delta have been under one ruler.

The food that was exported by caravan across the desert, or by ship across the sea, gave rise to so much trade that it could not be carried on by barter, and the Egyptians arranged to use coins or tokens, that is, *money*.

In order to keep the story clear we have spoken as if Egypt were the first or the only country where civilisation began. We have, however, in Chapter 2 already pointed out that there is another valley, that of the Euphrates and the Tigris, where the conditions are much the same as in Egypt. In this valley another civilisation grew up at almost the same time as that of Egypt.

THE BEGINNINGS OF TRADE

Traders passed constantly between the two countries and carried knowledge and ideas as well as goods from one to the other. Thus, some of the things that we have supposed were invented in the valley of the Nile may really have been invented in the valley of the Euphrates and the Tigris. What is clear is that in both Egypt and Mesopotamia Nature helped man to learn new and better ways of life through cultivation of fertile soils, brought down by rivers, in lands of warm and regular sunshine.

EXERCISES

1. Mark and name Egypt on your map of the world.
2. Find out, from other books, all you can about Cairo and Alexandria.
3. Find out, from other books, all you can about the Sphinx and the Pyramids.
4. Make a list of the conditions that made it possible for one civilisation to begin in Egypt.
5. Make a list of all the things that we owe either to the people of Egypt or Iraq.
6. What is a *delta*? How is it formed?

CHAPTER 5

THE RICE-GROWERS

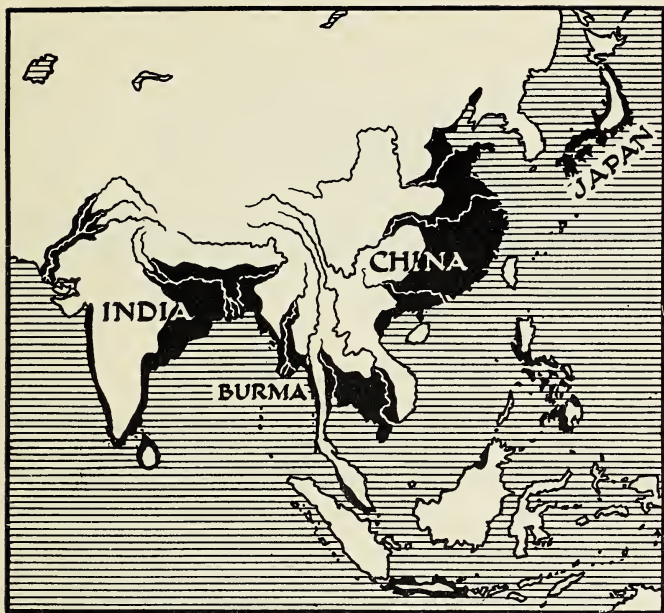
WE have seen that a very high civilisation grew up amongst the people who first learned to grow wheat. Another grew up amongst those who first learned to grow rice.

Rice is a kind of grass, and the part we eat is the seed. The stems of the rice are hollow and jointed like those of the tall grasses we see at home. At the end of each stem is a large number of little branches, each of which bears one grain; there may be as many as two hundred or three hundred grains at the end of a single stem.

Rice is cultivated on land that must be flooded with water and it needs great heat. It is grown chiefly, as the wheat once was, in hot, fertile river valleys, but the water it needs so much is brought by heavy rains. These rains, like the floods of the Nile, are, on the whole, regular and can be depended on. The home lands of the rice plant are in Asia—in India and China. Here, for six months of the year, the winds blow from the land and are dry; for the other six months of the year they blow from the sea and are wet. These winds are called *monsoon* winds and the lands where they blow are called monsoon lands.

As a rule, all over the world, the people who grow rice eat most, if not all, of the crop themselves. Thus they had not the surplus grain for export which, as we have seen, helped the Egyptians to build up their great civilisation. One country, however, Burma, has much more rice than it needs, and sends large quantities to other countries, where it is often sold as "Indian rice." In order to see what happens in the cultivation of rice we shall look at the rice growers of Burma. The methods are much the same in all the monsoon lands.

THE RICE-GROWERS



Map of South-eastern Asia, with the rice-growing parts of India, China, Burma, and Japan shown in black.

Because rice is grown under water, and for much of its life in standing water, the fields must be flat, so that the water may flow evenly over the whole of the surface. Hence, the rice fields are mostly in low-lying level plains, though in the hilly parts of Burma they are found in the valleys, and in other countries they are sometimes cut out in shelves on the sides of hills. To prevent the water from running away the fields are surrounded by little banks of earth which are often used as footpaths, for, at certain seasons, all the rest of the ground is either under water or, if not, very muddy.

THE CULTIVATORS



Courtesy, Indian Government.

Ploughing a rice field and planting out the young plants.

Rice is sown in a special field called the nursery, where it is allowed to grow till it is from six to twelve inches high; the rice nursery is flooded. While the young rice is growing in the nursery the other fields are being prepared. They are ploughed, under water, and turned into a rich sloppy mass of mud. The plough is made of wood, but has an iron point that cuts furrows in the ground. It is drawn by slow-moving oxen or by big, ugly animals, with huge horns, called water buffaloes.

When the fields are ready the young plants in the nursery are pulled up, about a hundred at a time, shaken gently to remove some of the mud, and then tied up in bundles. These are carried to the fields, where men and women, walking backwards deep in mud, push them into holes five or six inches apart: into each hole go two or three plants.

In the hot, wet air and ground growth is very rapid, often six to nine inches in twenty-four hours, so that two crops and sometimes more can be obtained from the same field in one season.

THE RICE-GROWERS

Between planting and harvesting the water must not be allowed to become stale, so fresh water has to be supplied as the stale runs away. Moreover, much time must be spent in keeping down the weeds, which are just as fond of water as the rice is and want to grow just as quickly!

As the plants ripen, they change in colour and the water is allowed to dry up gradually until the grain is fully ripe and ready for harvest. Harvest time is from October to December. The stalks are cut by hand with sickles, a certain amount of straw being left to be eaten, later on, by the cattle. The grain is tied up in bundles that look much like sheaves of wheat at home, and are left for two or three days to dry. They are then carried home to the village in carts drawn by bullocks or buffaloes.

To thresh the rice, the sheaves are spread in a big circle on a smooth, hard piece of ground, over which the cattle are slowly driven round and round, steadily trampling out the grain. When the threshing is done, there is a huge pile of grain,



[Courtesy, Indian Government.]

Cattle being driven over sheaves of rice to thresh it.

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[E.N.A.]

Women pounding rice to remove the husks.

husks, and bits of straw from which the grain has to be separated. The separating, or winnowing, is done by the wind as the mixture is being tossed into the air in a shallow pan or basket.

The rice is still not quite fit for use because it has a hard husk. In this condition it is called *paddy*; in fact, in the East, where most of the world's rice is grown, it is always called paddy, and the rice field is known as a paddy field. The husk is removed by pounding the rice with big pieces of wood in large, deep wooden bowls, after which it is again winnowed and then washed. The women usually do this kind of work, and in any small village you can hear a steady thump, thump, thump from morning to night. Much of the Burmese rice crop, as we have said, is sent away to other lands. That which is kept for use

THE RICE-GROWERS

at home is stored in large baskets made of cane and plastered outside with mud; these stand on a raised platform and are covered by a roof of leaves.

Cultivating rice is hard work. It means stooping or standing in blazing sunshine and, except at harvest time, in six inches of mud and more than six inches of water. The people who do this work in Burma are mostly the Burmese, but Chinese, Indians, and others are also to be found in the rice fields of the same land.

There is one great difference between the rice growers in the hot, rainy valleys of the monsoon lands and the wheat growers in the hot, dry valleys of Egypt and Iraq. We have seen that the floods, like the monsoon rains, are more or less regular.



Some of the lovely buildings in Rangoon.

[E.N.A.]

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But the Egyptian has to lift water from the river or dig canals to carry the flood water where the seeds want it. In Burma and parts of the other monsoon lands there is often less need for irrigation, because the rain falls on the fields without anybody's help or thought.

We may say, therefore, that rice growing does not need quite so much foresight as wheat growing in Egypt. The Burmese, and some other peoples of the monsoon lands, just wait for the rains and do not spend much time thinking how, by irrigation, to supply the needs of the crop. Moreover, rice cultivation demands much more effort from man than does wheat cultivation, and so leaves less leisure and energy for arts and crafts.

The Burmese, like other grain growers, are a civilised people. They have a written language and many schools, though not everyone can read and write. They weave beautiful cloth and they have built a number of magnificent temples and palaces. They are not such clever cultivators as some of those we shall read about later, but, with their simple implements, aided by their own hard labour and the right kind of weather, they produce large quantities of one of the chief grains of commerce.

EXERCISES

1. On a map of the world showing the chief climatic regions mark and name the monsoon countries.
2. On a map of the world name all the countries that grow rice.
3. Complete the following table:

State.	Area in 1,000 square miles.	Population in 1,000's.	Number of persons per square mile.
China . . .	1,531	302,113	
Bengal . . .	77	46,695	
Burma . . .	263	13,212	
Honshiu . . .	87	59,736	
Great Britain . . .	89	42,919	
Australia . . .	2,975	6,043	

Which of the above States have a denser population than Great Britain?

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4. The following figures give the temperature and rainfall readings at Calcutta:

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	65	70	79	85	86	85	83	82	83	80	72	65
Rainfall (in.)	0·3	1·0	1·1	1·5	5·6	11·0	12·3	12·7	10·4	3·9	0·6	0·3

Represent these figures by a diagram.

On the diagram draw vertical lines to divide the year into three parts to show the cool season, the hot season, and the wet season.

(*N.B.*—The last two exercises and others of the same type throughout this book are intended only for more advanced pupils. As many of them are as much exercises in arithmetic as in geography they could be worked out in the appropriate arithmetic lesson.)

CHAPTER 6

CHINA : THE LAND OF FARMERS

ONE of the chief lands where a great civilisation arose out of growing rice is China. China is a huge country with several different kinds of climate, so that life is not everywhere the same, nor are the crops everywhere alike. In many parts of China the farmer is helped by a fine rich soil. This is made up of dust¹ that has been blown, from the dry, dusty Gobi desert, for hundreds of years. There is so much of it that it has filled up valleys and buried hills. It is very deep and it is so fertile that it needs less manure than other kinds of soil.

In North China, in the basin of the Hwang-ho, the winters are cold and the chief crops are not rice, but millet, barley, and wheat.

In Central China, in the basin of the Yang-tse-kiang, the summer is longer and the winter milder and the chief crops are rice, cotton, tea, millet, oranges, and mulberries. On the mulberry leaves many silkworms are fed.

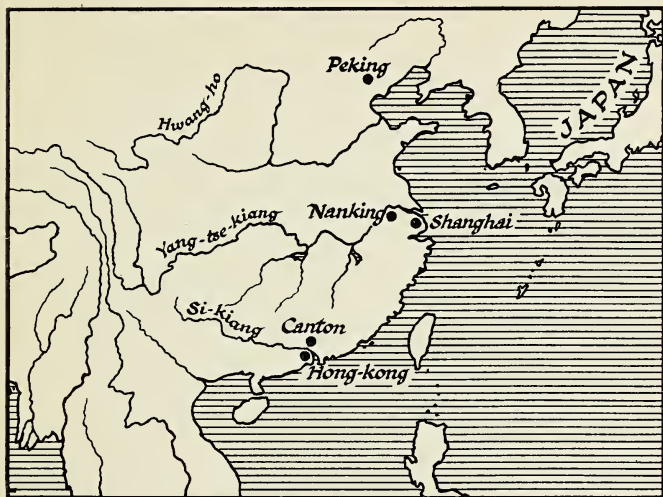
Southern China, in the basin of the Si-kiang, is warmer still; the crops include rice and many of those grown in Central China and also such fruits as bananas and pineapples.

Most of the Chinese, in whatever part of China they live, cultivate the ground to grow enough food for millions of people. There are, however, so many people that there is hardly enough land to support them all.

The farms on which the food is grown are very small. In parts of Canada a farm may contain thousands of acres; in England a big farm may often contain hundreds of acres: in the more fertile parts of China the farm may be no larger than

¹ Called *loess*, from a German word meaning *loose*.

CHINA : THE LAND [OF FARMERS



Map of China.

a football pitch. It is much more like a garden than a farm and the peasant uses the tools, not of a farmer, but of a gardener. The Chinese are the finest gardeners in the world.

On their tiny piece of land they try to produce all they need—food, fuel, building material, and clothes. Land is so scarce that grain is sometimes grown on the tops of houses or on rafts that float on the rivers.

Good land cannot be given up for roads, and some of the highways are only narrow footpaths, as in Egypt, two or three feet wide, between the cultivated fields. In some places, however, wide roads are now being built, and along these hundreds of motor-cars and motor lorries are to be seen.

Good land cannot be given up to animals. There are so few cows that milk is not drunk. There are so few sheep that

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wool is not worn. Shoes are made of grass or cloth and not of leather. Animal food is provided by chickens, ducks, pigs, and sometimes dogs. Ducks live in the water and pigs can be fed on what we think refuse. In those parts of China where the people spend their lives in boats, in order to save the land for crops, the pig may be kept in a cage hung over the side of the boat.

The Chinese farmers do not mind how long or how hard they work. They are up early in the morning, go to their fields before dawn, and do not return till the evening. There are no more industrious people in the world.

Because they have very few animals there is little animal manure and they are too poor to buy fertilisers. To give the land enough plant food is not easy. Each farmer digs a pit in the corner of his land and throws into it everything that will rot. All the waste of the house that we should send down the sewers he carries in buckets to the pit. He also digs fertile mud from the bottom of the canals, standing up to his waist in water as he does so. He mixes this mud with weeds or with clover that he has grown after the main crop has been harvested.

Of water he usually has enough, though the north tends to be rather dry. There are a great many rivers, and in the lowlands of the centre and the south there is a close network of canals by means of which water can be carried to the fields.

One of the troubles of the Chinese farmer is due to the fact that in the lowlands, which are the best farm-lands, the rivers sometimes change their courses. Rivers, as we have learned, carry silt. When they flow for a long way through big plains, they flow very slowly, and much of the silt drops to the bed of the river. This raises the bed and leaves less room for the river between the banks. If the banks are low, as they are in most plains, there is not room enough for the river when floods come.

To keep the flood water within bounds the Chinese build embankments, but, at times, the embankments give way, the

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A Chinese farmer bringing his pigs to market.

[E.N.A.]

river pours out all over the land for miles, houses and farms are ruined, people, crops, and animals are drowned and, when the river goes down, it may be flowing not in its old path but in quite a new one. The Hwang-ho has changed its course so often and done so much damage that it is called "China's sorrow."

In many places water has to be lifted to the level of the land. As there are no expensive pumps, the farmer spends hours and hours lifting it, as the Egyptian does, by the *shaduf* and the *sakieh*, or by other methods.

What the Chinese can grow in one year on a piece of land the size of a football pitch would surprise almost any farmer in

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any other part of the world. Yet his tools are few and simple. He may have a plough drawn by a water buffalo, but usually he is too poor to keep a buffalo and the farm is so small that a plough is not needed.

The implements in use are a dibble, a watering can, a hoe, perhaps a little wooden plough, but, above all, a spade. The spade is really a kind of hoe, but it is a much better tool. It is, in fact, the best of all farming implements, and those people like the Chinese and Japanese, who make much use of it, made



[E.N.A.]

Ploughing a rice field with a wooden plough drawn by a water buffalo.

CHINA : THE LAND OF FARMERS



Houses in a Chinese village.

[E.N.A.]

great progress in cultivation hundreds and hundreds of years ago.

The Chinese farmer lives in a village which is often surrounded by an earthen wall and may be quite a long way from the fields. The houses are closely packed together, as they are in Egypt, to save land, and the streets may be so narrow that a cart could hardly pass through them. The houses, like the crops, also vary a great deal. The walls may be of bricks made of a mixture of mud and straw and sometimes covered with a coat of plaster, or of pieces of bamboo woven together and plastered with mud. The roofs, in the south, are heavily thatched and slope steeply to shed the rain; in the north, where it is drier, they may be flat and made of a rough mud-and-straw plaster laid over sticks of willow. Here the houses of dried mud with their flat roofs and the absence of trees remind one again of things seen in Egypt.

Large houses are built round three sides of a courtyard, which is shut off from the street by heavy wooden doors. In the courtyard may be seen the gardening tools, a family of pigs, and

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a few chickens, and piles of rubbish that are being saved for fuel.

In the north, as we have said, the winters are cold, and fires are needed in the houses. There are few trees to give logs, and though there is a great deal of coal in China it has, in the past, been little used.

As fuel for fire is scarce, all kinds of things are burned. Grass, rice husks, straw, and roots are put on the fire and the ashes that are formed are afterwards taken to fertilise the land. To make as much use as possible of what heat there is, the smoke is made to pass under a hollow platform of dried clay which runs along one side of the room. The platform is about two feet high and six feet wide. Upon this the family sit during the daytime and sleep at night.

What about the Chinaman's clothes? There are few sheep to give wool and it is not easy to obtain warm clothes for winter wear. One of the things the Chinese have learned to grow is cotton, and much use is made of this. The working clothes, everywhere, are of faded blue cotton. Where the winters are cold one cotton gown after another is added as the wearer feels he needs them. On a winter day a man may be wearing five, six, or more layers. Some of these are padded with cotton wadding and look like eiderdown quilts.

The Chinese, however, have one little creature that provides them with another material out of which to make clothes—the silkworm. There are many wild silkworms in the monsoon lands and much wild silk is still collected. But much more is produced by keeping and rearing silkworms at home. It is thought that it was the Chinese who first learned to do this.

In Book II we have told how silkworms are reared in Japan. The Japanese probably learned how to do this from the Chinese. Here we must add two other facts about silkworms.

1. A great many silkworms can be reared in a very little space. This is important in a crowded country like China.

CHINA : THE LAND OF FARMERS



Chinese men seated on the heated platform of an inn.

[E.N.A.]

2. It requires much care and patience to rear silkworms, and such work is possible only where there is plenty of cheap labour and people who can take great pains. Such a country is China, where there are millions of people who have learned to work hard and carefully by growing rice. A nation of rice-growers is fitted to be a nation of silkworm rearers.

We need not, in this chapter, try to show how civilisation grew in China. The story is much the same as that for Egypt. China is a land of many beautiful arts and crafts and the home of many inventions. Amongst the special things invented by the Chinese were gunpowder, the mariner's compass, and printing.

EXERCISES

1. Name three things the Chinese did before other people.
2. Why do the Chinese use every bit of good land for farming?
3. Why do they raise few cows and sheep?
4. What animals do they rear?
5. Name the crops grown in different parts of China.

PART THREE : NATIVE TRIBES WHO TILL THE SOIL

CHAPTER 7

THE INDIANS OF BRITISH GUIANA



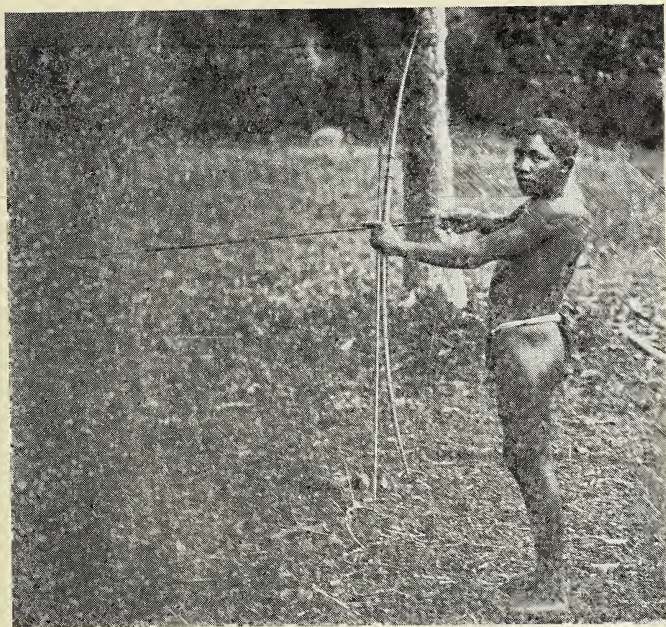
Map of South America, showing the position of British Guiana.

WE have been looking at lands where tilling the soil brought rich rewards and led to the rise of great civilisations. But there are other lands where people have learnt to cultivate the soil and yet go on living in a poor and lowly manner. This may happen because the climate, or the soil, or both are not so good for growing crops or because the land is “out of the way,” so that the people in it have not learnt new methods from traders and others.

There are, for instance, a number of red-skinned

Indian tribes, who live in the forests of British Guiana, who cultivate the soil as well as hunt and fish, and yet are very backward. The climate is hot and damp, and for a long time the tribes were cut off from the outside world by the forests and by the marshes that lie along the shores.

THE INDIANS OF BRITISH GUIANA



An Indian of British Guiana with his bow and arrows.

Let us note, about these people, four important things,

1. *The men are still mostly nothing but hunters and fishers*, and, like the other hunters we have seen, are very clever at capturing food. With well-trained dogs they track down wild hogs, tapir, and deer which they shoot with bows and arrows and blow-guns. They catch fish in nets made of the fibres of palm leaves or in traps; they shoot them with bows and arrows, and they poison the river water so that the fish become dazed and float on the surface.

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They are, in fact, so clever that they sometimes return from the forest with enough food to last for a week or so. What they do not eat at once they dry in the smoke of a wood fire so that it will keep for some time. When they are not hunting, they spend most of their time lying in their hammocks smoking and talking.

2. *The women cultivate the ground*, but the men give them some help. The land, as we have already said, is covered with forest and before there can be any cultivation the ground must be cleared. This kind of work is too hard for the women. It is the men who, with axes and knives that they obtain from traders, hack down the bush and fell the trees. We shall find, all the world over, that as a general rule, work which requires great strength is done by the men.

After the trees have been felled and piled in heaps they are burned. When the weather is dry the men make fire, as the Stone Age peoples did, by twisting a stick round and round in a groove cut in another piece of wood, and set light to the mass of dry leaves and branches. The bushes and the smaller branches are completely burned and cover the ground with a layer of white ashes that is very rich in plant food.

3. *The only tool that is used is a digging stick*, the simplest of all farm implements. We have seen that other simple peoples, such as the Bushmen, the natives of Australia, and others, also carry pointed digging sticks with which they dig up roots to eat. We can imagine that when women began to cultivate the ground they went on using the digging stick, not only to dig up plants, but also to make holes in which to put shoots and roots.

4. *The things grown are grown mostly from shoots*. This is a rather lazy kind of farming because almost all that is done is to stick the shoots in the ground and then leave them to take care of themselves.

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Making fire by twisting a stick in a groove in another piece of wood. [E.N.A.]

The most important food plant of the Indians of British Guiana is *manioc* or *cassava*. This is a root which is grown from cuttings and needs very little attention. The women commence to plant it at the beginning of the rainy season, when the ashes of the burnt plants are well washed into the soil. They cut a number of shoots from a manioc shrub and place them in great baskets which they carry on their backs. They loosen the soil with a stick, remove the weeds by hand, and push two or three shoots of manioc into each hole. For a week or two the young cuttings have a fight to live because a mass of wild plants springs up all around them and tries to choke them.

The women do not help their crops very much. They just break off the tallest of the weeds and leave the shoots to fight their own battle against the shorter ones. In about six or

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Huts in a clearing in the forest.

[Imperial Institute Collections.]

eight months the new manioc shrubs begin to seed and the roots are then ready to be lifted. The women cut down the bush, loosen the earth once more with the digging stick, and pull up the parsnip-like roots, as they are wanted, so many each day.

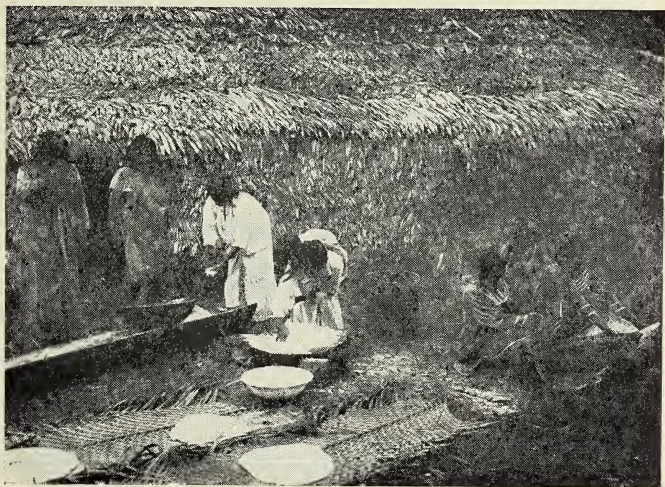
A clearing can be cultivated only for a short time. After two or three seasons all the plant food in it has been used up. The tribe must then move and cut down more forest. This means that a proper house is never built. The home is

THE INDIANS OF BRITISH GUIANA

nothing more than a shelter of posts and leaves. It consists of a roof to keep off the rain and the sun, and perhaps a thin wall of palm leaves on the windy side to keep out the wind. Under the shelter are hammocks, carved wooden stools, hunting weapons, baskets woven from palm leaves, and cooking pots and pitchers made of dried clay.

One of the first things that women did after they had learned to farm and had begun to stay at home was to make vessels in which to store food. Hunters very often carried water in skins or used the horns of animals as cups from which to drink, but they had no pots. The first potters were the first farmers.

These Indians of British Guiana, simple as they are, have also learned how to cook. Preparing manioc for eating is not



Indian women preparing cassava.

[H. J. Shepstone.

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easy because manioc contains a great deal of poison. The root is first peeled. It is then rubbed into a kind of pulp on a board into which very small sharp stones have been set. The pulp is next placed in a closely woven basket and squeezed to get rid of the poisonous juice. When free from poison it is baked in thin cakes like pancakes, on a piece of thin stone over a wood fire.¹

Fish and meat are stewed in an earthenware pot with peppers and the juice of the manioc root: it is curious that this juice is not poisonous if it is boiled. Another favourite food is salt, which the children suck like sweets.

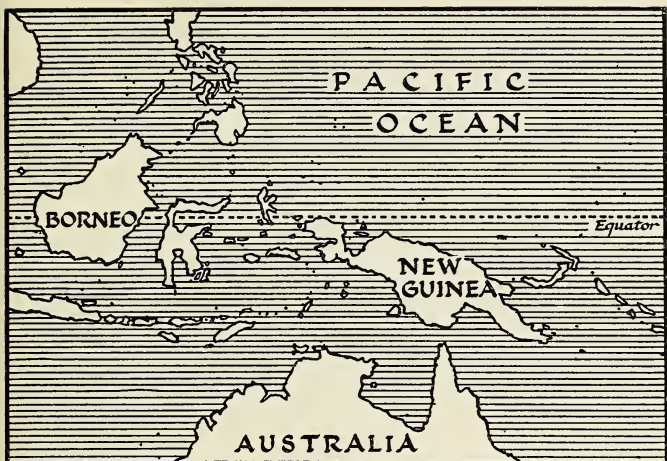
It will be seen, in the case of these Indians, that though hunting is still the chief occupation, yet farming helps them to live more easily because there is always something to eat. There would be more to eat if they knew more about other plants. They could grow coffee, rice, cocoa, and a great many different kinds of fruits and crops now known to modern man, but they have not yet learned about them, and remain content with their meat, fish, and manioc.

They are far removed from the successful grain cultivators of the Old World, but, at the same time, they are better off than the people of the Old Stone Age. It is true that they still hunt and fish, still use stones for some purposes, wear very few clothes, and have rather poor shelters for houses, but they have pots and baskets, wooden stools on which to sit, hammocks in which to sleep, and they make cakes and stews, and do not live so much on raw flesh.

¹ Tapioca is made from manioc flour.

EXERCISES

1. Mark British Guiana on a map of the world.
2. What four things have we noted as important about the Indians of British Guiana?
3. What kind of a land is British Guiana? Why is it, in some ways, an easy land in which to grow food?



Map showing the position of New Guinea off the north coast of Australia.

CHAPTER 8

HOEING AND HUNTING IN PAPUA

WE have said that the first tools to be used in agriculture were the digging stick, then the pick, and then the hoe and that the hoe is widely used in Europe, Asia, and Africa. We have just seen that amongst the Indians of British Guiana where the men hunt and fish, the women till the soil with the digging stick. If we now go to New Guinea we shall find another people where the men still hunt and fish, but the women till the soil with a hoe as well as a digging stick.

New Guinea, which lies to the north of Australia, is one of the largest islands in the world. The eastern part of this great

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island belongs to the British Empire and is called Papua. Its chief river is the Fly River, and on an island in the mouth of that river live a tribe of Papuans who form the subject of this chapter. Like all the other Papuans they are tall, dark-skinned, and woolly haired.

The men, as we have said, spend most of their time hunting and fishing. Their chief food animal is a wild pig that roams through the forest and breaks into the plantations in search of food. It is hunted with spears and with bows and poisoned arrows. The bows are made of pieces of split bamboo, and the strings are of bamboo fibre. Many different kinds of arrows are used, but the most common are tipped with a sharp piece of bone or an animal's claw. The spear is also used for catching large fish and crocodiles; smaller fish are caught in traps.



[E.N.A.]

Natives carrying a wild pig which they have killed with a spear.

HOEING AND HUNTING IN PAPUA



[E.N.A.]

A native spearing fish on a coral reef.

Because Papua is near the Equator it is always hot and wet. Hence the land is largely covered with thick forest, and before the ground can be tilled it must be cleared. The Papuan men, like the Guiana Indians, do this hard work. They also dig drains to carry away the water in the wet season. With a digging stick of hard wood they loosen clods of earth, which they throw away with their hands. They then kneel in the trench and slowly move forwards, cutting away the earth in front of them.

When they have finished their share of the farm work, the women begin theirs. In November, before the rainy season sets in, they plant such things as bananas, sweet potatoes, coconuts, and yams. Bananas are grown from shoots, coconuts from other coconuts, and yams from cuttings, simply by sticking these things in the ground, but in the case of the yam a little more trouble has to be taken than, say, with manioc.

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The yam grows underground like a potato. Sometimes it is no bigger than a potato; it may, however, be as big as a baby. Soon after being planted it sends up many shoots. When the



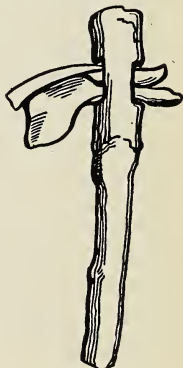
An animal's jaw with a large tooth, used as a carving tool.

young shoots are well above the soil, canes are stuck in the ground, one to every plant. Each shoot is tied to its own cane by a piece of leaf fibre. Now and again the gardens have to be weeded to prevent the yams from being choked, and this is done, not with a stick, but with a hoe. The blade of the hoe is a large, hard shell, something like that of a very big oyster. A hole is bored in the wooden handle of the hoe by means of the sharpened tusk of a boar and the shell is fastened into the hole with wooden wedges.

In May, when the yams are ready for eating, the part above the ground is cut off with a shell knife, after which the potato-like thing under ground is dug up when needed, put into baskets, and carried back to the home.

The home in this case is not quite a real house. It is perhaps better to call it a hut, and as building a hut is rather hard work, the builders are the men. Until a few years ago the trees that were used were felled with stone axes. A piece of flat stone was chipped, ground, and polished, after the manner of the New Stone Age, to form a keen cutting edge, and then tightly fastened to the short arm of a forked stick.

It was not easy to fell a tree with such a tool, and fire was used to help. The fire was lighted round the trunk to char



A hoe with a shell blade.

HOEING AND HUNTING IN PAPUA

the outside, which could then be chipped away by the axe. Burning and chopping were repeated time after time until the tree crashed down. The boughs and their ends were sawn off with a saw made of a rope of twisted strips of bamboo. A sharp shell took the place of a plane and the dried skin of a kind of fish (the sting ray) was used for sandpaper.

In these days the Papuans are beginning to use tools of steel that they buy from traders.

The houses are built on piles, with the floor high above the ground, to escape floods. The floor boards are made of the split trunks of trees. The roof is thatched with palm leaves, is steep to shed the rain, and comes down to within two feet of the ground on each side. The two ends of the house are filled in with split planks to make strong and solid walls. There are, generally, two doorways, one at each end, provided with a ladder that is nothing but a slanting tree trunk with notches cut in it to form rough steps.



[E.N.A.]

Making a canoe from the trunk of a tree with the aid of a bone chisel.

THE CULTIVATORS



One of the large huts in which the unmarried men live.

[E.N.A.]

The Papuan huts are very large; some of them are over one hundred and fifty yards long. As a rule there are two such houses, close together, one for all the men who are not married and the other for the married people and the children.

The interior of the house is dark and gloomy except round the many fires that flicker along its whole length. On each side of the central gangway, between the many carved pillars, each family has a separate room, but there are no walls to separate the one from the others. The members of a family gather round their own clay fireplace away from the others, except when they want to chat together, when they assemble round the public fire, which burns near the entrance porch at the end of the building.

One of the reasons for living all together in this way is to guard against enemies: war began when people had anything

HOEING AND HUNTING IN PAPUA

worth stealing, that is, somewhere about the time of the first herders and farmers.

Clothing is apt to be scarce, though the women have a kind of skirt made from the fibres of the leaves of the banana or sago palm. For ornaments there are armlets, necklaces of shells, wonderful head-dresses of feathers, and sometimes spikes through the nose.

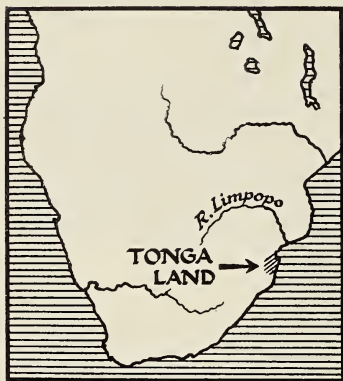
It is clear that the Papuans are only a little better off than the Indians of British Guiana. Their tools and weapons still belong to the Stone Age, but to the New Stone Age, because they include the hoe. In one way they are more backward, for they have not learned to make pots. They cook some of their food in large shells and they roast their meat over a fire or bake it in a hole dug in the ground.

EXERCISES

1. Mark New Guinea on your map of the world.
2. Draw a digging stick, a pick, and a hoe.
3. In what ways is New Guinea like Guiana?
4. Which of the four things that we noted about the Indians of Guiana are also true of the Papuans?

CHAPTER 9

HOEING] AND HERDING IN SOUTH AFRICA: THE KAFFIRS



Map of South Africa, showing the position of Tonga Land.

THE Indians of Guiana and the Papuans of New Guinea are hunters who add to their food supply by growing, in very simple ways, a number of food plants that belong to their own country.

We are now going to South Africa to visit the Kaffirs, who no longer depend on food obtained by hunting and collecting, but on herding and grain growing. Moreover, they learned both herding and

grain growing, and obtained the grain, from people of other races. Their life is still simple and lowly and they are content to provide food merely for their own needs. They have not yet begun to think of growing a large surplus to sell.

There are many tribes of Kaffirs and they do not all live in exactly the same way. Those spoken about in this chapter inhabit Tonga Land, to the south of the River Limpopo.

Because the Kaffirs have crops and herds they do not wander about like hunters and, as we know, this staying at home brings many changes in ways of living. In the first place it means

THE KAFFIRS

more division of labour. There was, of course, even in the Old Stone Age, some division of labour between men and women, but there was much more amongst the herders and the farmers of the New Stone Age. There is still more amongst the Kaffirs, where the chief occupations are looking after the cattle and tilling the ground.

Looking after the cattle is divided between the men and the boys. Early in the morning the men milk the cows, which are kept mainly for their milk and are rarely killed for food. When the milking is over the boys drive the cattle out of the enclosures, where they have been kept all night, to the grass-land where they graze.

Tilling the ground is the work of the women and is done with a hoe, but it is the men who fashion handles for the hoes and fasten into them the iron blades that they have bought at the stores. The men are still the tool-makers as they were in the Stone Ages.

The hoe has a blade shaped like a "spade" in a pack of cards and is fixed into a wooden handle about as long as a walking stick. The woman uses it in the same way as we should use a pick. She drives it into the ground, turns over the clods, breaks them up, and takes out the roots of weeds and bushes.

Next comes the planting, and it is here that the Kaffir woman has gone ahead, for she sows *seed* and does not simply stick shoots in the ground. Cultivating crops from seed means harder work and more thought. It educates the farmer.

She sows millet (Kaffir corn), monkey nuts, beans, tobacco, and many other things, but the most important of all is maize



The Kaffir hoe.

THE CULTIVATORS



[Courtesy, South African Government.

Kaffir women in a maize field.

(Indian corn), because it is the chief food. Maize is an American grain and the Kaffir would be neither growing nor eating it if America had never been discovered.

If her field is a large one the Kaffir woman will ask her neighbours to come to help her. This they do quite willingly because they know that they may, in a day or two, need her help in return. Helping each other in this way—co-operation—is another great benefit that tilling the soil brought to mankind.

The sowers form a line on one side of the field and work across it, hoeing and sowing and singing as they go. They begin work in the early morning and toil as hard as they can in order to finish before the heat of the day.

Sowing is a back-aching business. Each woman digs her hoe in the ground, scoops up a hoeful of earth, places a few maize seeds in the hole, carefully covers them with soil, and stoops all the time.

THE KAFFIRS

While the crop is growing the ground has to be kept clear of weeds. This is also done by the women with a hoe. When the grain is nearly ripe birds arrive to steal the crop, and the women and children go to live in little huts in the field. Building the huts is another job for father. From morning to night the women and children try to frighten the birds away by yelling and shouting. Sometimes snail shells are hung on strings stretched across the field. The women sit in the shade and by pulling the string make a jingling noise that may scare away the birds.

When the maize is fully ripe the cobs are picked, stripped of their outside leaves, carried home in baskets, and placed in small store-houses. These houses are on posts to be out of the way of animals.



[Courtesy, South African Government.]

A Kaffir girl grinding maize.

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The crop is a grain, like millet or wheat, and must be threshed to get rid of the husk. The Kaffir threshing ground is a part of a field that has been trodden down and smeared with clay. The grain is placed upon the smooth, hard floor and beaten, by the women, with sticks, till the seeds are free.

Because Kaffirs are herders and farmers they need not wander about and can have a real home. This home is a round hut built partly by the men and partly by the women.

The man builds the wall with rods, cuts sticks for the conical roof, and thatches it with bundles of grass that he gathers. The woman collects clay and plasters it all over the outside of the walls and makes a clay fireplace for cooking in the centre of the floor.

Over this fireplace she cooks, but only once a day. The chief food is a thick porridge made from millet or maize and a sauce containing ground-up monkey nuts or beans. Some Kaffir tribes feed very well, for they may keep, besides cattle, such other animals as sheep, goats, pigs, hens, turkeys, ducks, and geese. Most of the food is boiled in a clay pot. The smoke from the fire hangs about the hut till it escapes by the doorway or through cracks in the walls and roof, for the hut has neither chimney nor windows. The big meal of the day is taken in the evening when the day's work is finished. If anything is left over it is eaten at breakfast next morning.

Now notice another very important fact. *Villages*, as well as huts and houses, *begin with growing grain*. Hunters and fishers, and collectors of nuts and fruits from trees in forests, have no villages. If too many people live close together they soon eat up all the food that can be found wild. But when men raise food from the soil they can live near each other, and villages are built.

The Kaffir village is called a *kraal*. From a distance it looks like a fairy ring of mushrooms. The huts are built in

THE KAFFIRS



[Courtesy, South African Government.]

A Kaffir hut, with thatched roof and walls plastered with clay.

a ring. Outside them is a strong fence, also in a circle, in which the cattle are kept at night for fear of wild animals.

This account of the Kaffirs shows us how much better man can live when he has learned to till the soil, but the Kaffir has been helped both by the climate and by the Europeans who have settled in South Africa, and taught him better ways of farming.

EXERCISES

1. Mark Tonga Land and the Limpopo on your map of the world.
2. Mention some more important things that began with farming.
3. Draw a Kaffir hoe and a Kaffir house.
4. Find out (see an encyclopædia) what you can about maize and millet.

PART FOUR : GROWING THE WORLD'S FOOD TO-DAY

CHAPTER 10

HOW TRADE BECAME POSSIBLE

AFTER the plough and irrigation had been invented there was little more real advance in agriculture for hundreds and hundreds of years. There was no farming on a large scale as we know it. There was no need for it. Most countries grew most of what they wanted and consumed what they grew: anything that had to come from foreign lands, such as pepper and other spices, tea, raw cotton, and some kinds of fruits, tended to be dear.

To-day thousands of ships cross and recross the oceans laden with food, fibres, timber, and other things that are grown for use in lands where they cannot be grown at all or where not enough of them can be grown to meet the needs of the people. How these needs arose we shall see in Books IV and V. Here, all that we need to do is to point out that there could be no growing on a large scale and no big trade in any of those "fruits of the earth" that men collect or cultivate until certain things had happened.

1. Somebody had to produce more than was needed for use at home. There had to be something left over that he wanted to sell : there had to be a *surplus*. There are still millions of people, about some of whom we have already learned, who produce only just enough for their own wants.

2. Somebody had to need this surplus. For instance, in England the number of people grew so quickly that Britain could not produce enough wheat to feed them. More meat and fruit were needed, and also such things as tea, coffee, and

HOW TRADE BECAME POSSIBLE



[Will F. Taylor.]

Ploughing with horses in Surrey.

cocoa. The rise of manufactures caused a demand for raw cotton, rubber, silk, and many other things that cannot be grown in Britain because the climate is not suitable. There had to be *people who wanted to buy* as well as people who wanted to sell.

3. There could be no farming on a large scale until man had found how to make and use *machines*, and there were no such machines till after he had learned to use steam. There was, for instance, no steam plough in England when the editor of this series of books was born. And in parts of England to-day we still plough with horses and even with oxen. But the farmer who now wishes for them can have machines, driven by steam or petrol, with which to plough the soil, sow the seed, and thresh the crops. He may use a motor-car in which to go

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from one part of the farm to another or to the market town where he sells what he has reaped. He may have a motor lorry to carry the crops, a telephone by means of which he can speak to those who want to buy them, and may receive news about the weather by means of the wireless.

With the help of machines huge quantities of food and other plant materials are now grown for the use of those who live in towns and cities and work in offices, factories, and mines. The Chinese, in a garden, mostly grow food for a family; the farmers of the prairie and the ranch grow food for the world. There are, however, still millions of farmers, especially in the hot lands, who have no reaping or threshing machines, motor lorries, telephones, or wireless.

4. *Science* has come to the help of the farmer in many ways. There were no artificial manures to put on the fields till man knew enough chemistry to make them and enough about the life of plants to know what foods they needed. Some of the people of whom we have learned do not manure their land, except with the ashes of the plants and trees that they burn when they clear the ground.

5. There had to be means of carrying the surplus when it had been produced. Thus roads had to be improved and railways and steam ships had to be invented. In our days the motor is making *transport* even easier and quicker. We shall learn about means of transport in Book V.

6. Many things could not be transported for long distances because they would have gone bad on the way. Certain fruits, e.g. grapes and peaches, could be dried but they could not be exported fresh, and no fresh meat could reach us from New Zealand or Argentina. Then the scientist invented *cold storage*, and the *canning* of fruits, vegetables, and meat, and now we may eat things grown thousands of miles away in as fresh a state as they were on the day they were gathered.

HOW TRADE BECAME POSSIBLE



Girls canning beans in an English canning factory.

[Fox Photos.]

All kinds of farming depend for their success on soil, weather, and people. About the people we shall have something to say later on. We need not, here, say much about the soil, because there is soil fertile enough for farming almost everywhere, even in deserts.

The climate is more important. When we talk about the climate we have in mind chiefly the temperature and the rainfall. If we are speaking of temperature we call one land hot, another warm, another cool, and another cold. Temperature makes a lot of difference to plants. There are countries that are too cold for bananas or too hot for apples.

What matters most to the farmer, however, is not the soil or the temperature, but the rain. On most soils and in most temperatures some kind of plant will grow, but without water

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nothing will grow at all. The farmer can, of course, sometimes obtain water from wells or rivers in order to irrigate crops in a dry land, but this comes from rain that has fallen somewhere else. *How much* rain falls is important. Some parts of the earth have too little. *When* the rain falls is also important. There are lands where the rain falls in summer, others where it falls in winter, and others where it rains in all seasons of the year.

By thinking of the rain and the temperature together we can divide the world up into a number of what are called *natural regions*. Thus we can speak of a hot wet land, a hot dry land, a hot land with summer rain, a cool land with winter rain, a cool land with rain all the year round, and so on. Each of these regions has its own kind of climate which is suitable for certain kinds of plants and animals. This makes it possible to take a plant from one region and grow it in another with similar climate, thousands of miles away. Orange trees, for instance, were taken from the south of Europe to California, to parts of South Africa, and to parts of Australia where the climate was similar, and we now receive large quantities of this fruit from regions where it was not formerly grown. It would have been useless, however, to try to grow oranges in England, because the oranges would not ripen in our cool climate.

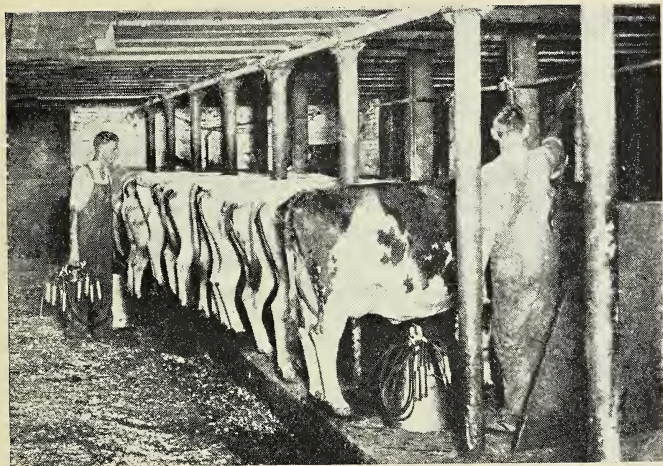
In all those lands where there is farming on a big scale, we may find one or more of the four following kinds:

1. The rearing of cattle and sheep. This is called *stock raising*, or stock farming. The people who practise this kind of farming are the herders of whom we spoke in Book II.

2. *Dairy farming*.—This is a special form of herding, the animals being kept chiefly for their milk and not for their meat or hides. We have learned about the dairy farmer also in Book II.

3. *Crop farming*.—This is the growing of anything in large quantities, not for home use, but for the markets of the world.

HOW TRADE BECAME POSSIBLE



Milking cows with electrical apparatus.

[Courtesy, C.P.R.]

The crops may be of things used for food, such as wheat, or of things used for clothes, such as cotton.

4. *Mixed farming*.—In this kind of farming the farmer may grow several kinds of crops and also rear several kinds of animals. Mixed farming is most important in lands that are thickly peopled, such as England, some of the countries of the continent of Europe, and in those parts of newer countries like Canada and Australia, where many people now live close together.

EXERCISES

1. Make a list of the different kinds of tools used in farming. Name at least one place where each is used.
2. Name the things that must happen before there can be farming on a large scale.
3. What things do we need to know about a country before we can say what crops might be grown there?
4. Name the four different kinds of farming. State at least one country where each is carried on.

CHAPTER II

FARMING IN BRITAIN

MOST people do not think of Britain as a farming country, yet agriculture is still the most important single industry in Britain, even though not enough food is grown in the British Isles to support the people who live there.

Though Britain is so small, there are wide differences in soil and climate, and in nearness to big towns where crops can be sold. The western side of the British Isles, for instance, is rather too wet for grains like wheat, but is suitable for grass, especially as the winters are so mild. Hence many farmers in the west rear cattle and grow root crops to supply them with food in the winter. The centre and west provide much of the home supplies of beef and milk. In the days when transport was difficult most of the milk was turned into cheese (Cheddar and Cheshire), but now most of it is sent to the big towns.

The driest side of the British Isles, just dry enough and warm enough for wheat, is in the east, and as the soil of eastern England, particularly in the Fens and East Anglia, is very fertile, this is where most of the home-grown wheat is produced.

The British wheat farmer has to take into account two important facts:

1. The English weather is very uncertain so that he cannot afford to grow the same crop on all his fields. If he did, then a season of weather not suitable for that crop would ruin him. He therefore grows several different crops. If a wet summer spoils the grain it will, on the other hand, give him a fine crop of grass for his cows; if a dry season withers the grass he looks forward to reaping a fine harvest from his wheat fields.

2. The same crop will not grow well on the same land, year

FARMING IN BRITAIN

after year, because it soon uses up all the suitable plant food which that land contains. In countries where there is plenty of land the farmer moves from one piece of ground to another.

The civilised farmer, however, changes the crops on his fields season after season. The change is known as the *rotation of crops*. Different farmers have different plans, but a common one is the following:

1st year. Wheat.

2nd year. Roots, e.g. swedes, mangold wurzels, turnips, or sugar beets.

3rd year. Oats or barley.

4th year. Clover, beans, or peas.



Map of England and Wales, with the wheat-growing areas shown in black.

The diagram on the next page shows how a wheat farmer may plan what is to be grown on each of his fields. We see that he practises what is known as *mixed farming*. He grows barley for beer and as food for his animals ; roots, oats, clover, and grass also for his animals ; and wheat for bread.

The farming year may be said to begin in October. By then all the harvests of the previous season have been gathered in, except the root crops ; the grain has been threshed, and the hay ricks and the straw stacks have been thatched. The farmer has finished with one season and looks forward to the coming year.

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The first thing to be done is to feed the land. Manure is carried into the fields and spread evenly over the surface. After this the fields are ploughed and harrowed and then rolled to make the surface fine enough for the seed to be sown.

A short while after sowing the young wheat plants begin to appear above the surface like blades of grass. They grow only to a height of a few inches before the winter comes, when growth ceases until the spring.

In November the root crops are ready to be lifted. They are pulled up by hand, thrown into a wagon, and carted to one corner of the field. Here they are stacked in a long heap and covered with straw and turf to keep out the frost and the rain.

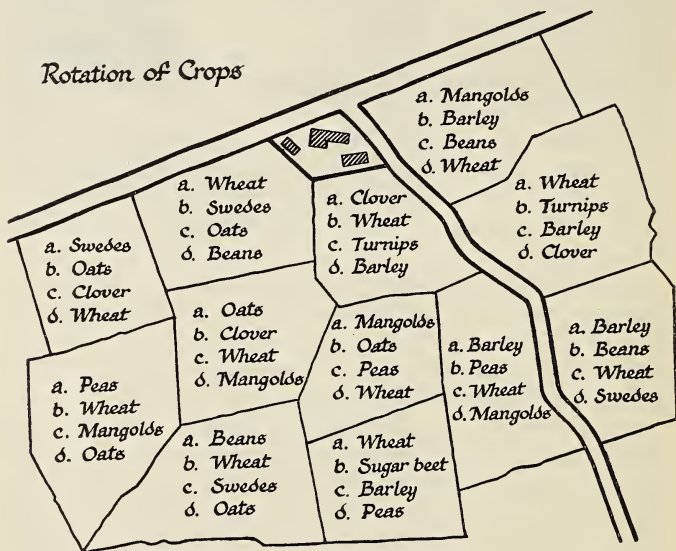


Diagram showing the crops which a farmer may grow during four years.

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[Sport and General.]

Sorting potatoes on a Lincolnshire farm.

The roots remain fresh and can be used, during the winter, to feed cattle and sheep when grass is scarce.

In the spring the fields from which the root crops have been removed are ploughed up to allow for the sowing of oats and barley and land is prepared for mangolds and swedes. About three weeks later these crops will have to be thinned out to give the roots plenty of room to grow and weeds will have to be hoed up to prevent the young plants from becoming choked.

In June the farmer begins to reap the first of his crops—say, clover. This is cut down with a mowing machine, left on the ground till dry enough to be carted to the rickyard and piled into a stack. Shortly after this the hay crop is ready to be gathered, dried, and stacked.

In August the wheat should be ready for cutting. This is generally done by a machine which cuts the straw close to the

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Building a hay-rick.

[Will F. Taylor

ground and binds it into sheaves. Farm workers follow the reaper and make piles of the sheaves by leaning one against the other in such a way that the wind can easily pass between the sheaves. After about a week the wheat is dry enough to be threshed. Some farmers make ricks of their wheat and leave it for several months before threshing it, but many thresh it

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Tractors in use on a farm in Norfolk.

[Sport and General.]

shortly after the harvest. In the threshing machine the grain is separated from the straw. The straw is dropped out while the grain, freed from its chaff, is delivered at the far end sorted into three different sizes.

The farmer not only has to rear animals and grow crops, but he has also to find customers to buy them. To help him do this markets are held, generally once a week, in all the larger towns in agricultural districts. Farm animals are driven into the market square and placed in pens, where they can be inspected by the buyers, and samples of grain and other crops are placed on view inside a large hall. The buyers look at these things and decide what they want to buy and what price they are prepared to give. Then an auctioneer comes round and the produce is sold to the highest bidder.

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Besides the grain growers and the stock rearers there are fruit growers and market gardeners. We shall have something to say about fruit growers in Chapter 14.

The market gardeners live near to the big cities and grow vegetables for the use of town dwellers. Because the vegetables are wanted fresh in the morning they are sent to market the night before. While other people are in bed the cabbages, turnips, peas, beans, and other vegetables are entering the sleeping city. There is in almost every city a special market for fruit, flowers, and vegetables that is busiest about the hour of dawn. The largest of such markets in Britain is Covent Garden in London.

EXERCISES

1. On a map of the world showing the chief climatic regions, mark those that have a climate similar to our own. Make a list of the countries.
2. The following table gives the rainfall and temperature readings throughout the year at London:

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	39	40	43	47	53	59	63	62	57	49	44	39
Rainfall (in.)	1·8	1·7	1·7	1·7	1·8	2·3	2·6	2·4	2·0	2·7	2·3	2·1

- (a) What is the difference between the average temperature of January and of July?
- (b) How much rain falls in the following groups of three months?
 - (1) December–February.
 - (2) March–May.
 - (3) June–August.
 - (4) September–November.
3. Point out the main differences between the work of a farmer in Norfolk and one in Somerset.
4. Say what you understand by crop rotation and explain why it is used.
5. Make a list of the months of the year in pairs, beginning with December and January. Opposite each pair state what a farmer in Norfolk is likely to be doing during these months.
6. Write down the advantages and the disadvantages of a farmer's life compared with that of a worker in a manufacturing town.



Map of the world, with the wheat-growing areas shown in black.

CHAPTER 12

GROWING WHEAT IN CANADA

THE two chief grains eaten as human food are wheat and rice, though others such as rye, barley, and oats are also widely used. As we have already given an account of the growing of rice in Chapter 5, we shall, in this chapter, deal chiefly with wheat.

Wheat, like rice, is a cultivated grass. We may, therefore, expect to find the chief wheat growers on the grass-lands, that is, on lands where there are few or no trees, but where there is enough rain for grass and the summers are dry enough and warm enough to ripen the grain.

All parts of the grass-lands do not receive the same amount of rain and those that are too dry for growing grain are given up to cattle rearing. It is only in the moister parts that the huge wheat fields are found.

There are wide areas of wheat in Hungary and Rumania around the River Danube, in southern Russia, in Argentina, Australia, and parts of India, but most important are the great prairie lands of the United States and Canada.

THE CULTIVATORS



Ploughing in Canada.

[Courtesy, Canadian Government.]

In the Canadian prairies the winters are very cold and the land is white with snow, though the snow is not, usually, very deep. The ground is frozen too hard to be ploughed, and there is not much work to be done at this season. Spring comes suddenly. The ground thaws and the snow melts.

The melting snow supplies the water that the seeds will need in order to sprout, for there is not much rain at this time of theyear.

For several weeks the farmer is very busy trying to finish his ploughing as soon as ever he can. On small farms he uses a plough drawn by horses, but most of the prairie farmers now use motor ploughs that cut several furrows at the same time. Ploughing may go on not only all day, but often all night as well by the light of strong head-lamps on the front of the motor.

Harrowing follows, and by the beginning of April the ground

GROWING WHEAT IN CANADA

is ready for the seed, which is sown by a machine called a *drill*. It is now early summer. At this time of the year, when the wheat needs moisture to make it grow into fine, strong plants, the prairie receives most of its rain. The rest of the summer is warm and dry and so suitable for ripening the wheat. By the end of August the wheat is ready for the harvest, the busiest time of all the year for the prairie farmer, because he has to harvest the whole of his crop before the coming of the autumn frosts.

On large farms a machine called a *combine* both cuts the crop and threshes the seed out of the ear. On smaller farms, where the farmer cannot afford to buy such a costly machine, a *binder* is used. This cuts the wheat and binds it into sheaves. The sheaves are then carted to some convenient spot and heaped up to form a huge wheat stack.

Presently a travelling threshing machine arrives. The



A combine in use.

Courtesy, Canadian Government.

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threshing gang, who travel with the machine, heave the wheat, with pitch-forks, into one side of the thresher. Out of the other side comes a stream of straw, most of which is afterwards burned, and a stream of grain which drops into a wagon.

The wagon is driven to the nearest railway station, where the grain is stored in an elevator till it can be moved by rail. In time it will be taken by trains, often half a mile long, to collecting centres from which it can be exported in ships. Most of it goes through Winnipeg to Fort William or Port Arthur on the shores of Lake Superior, thence by steamer to Georgian Bay on Lake Huron, by rail to Montreal, and finally by steamer across the ocean. Some goes, especially in the winter, when the St. Lawrence is frozen, westward across the Rocky Mountains to Vancouver and now some goes by rail to Churchill, and out by Hudson Bay. The latter route is open only in August, September, and October; it is frozen for the rest of the year.

As soon as the harvest is over the Canadian farmer begins to plough again. He wants to plough as much land as he can before the winter frost sets in. This autumn ploughing is good for the soil; it gives the frost a chance to break up the clods and kill harmful worms and other pests. The time, however, is very short and the farmer is seldom able to turn all his fields over before the beginning of the winter.

We have seen that an English wheat farmer grows other crops besides wheat in order not to exhaust his land. In the prairies the soil is so rich that the farmers grow wheat year after year on nearly all their land. But they do not get such heavy crops. In England the average yield is about thirty-three bushels an acre; in Canada it is less than twenty bushels an acre.

Moreover, in Canada and in some of the other wheat-growing lands, the farmers are beginning to understand that it is not wise to depend entirely on one crop; mixed farming is slowly spreading.

GROWING WHEAT IN CANADA



[Courtesy, Canadian Government.]
Roadside elevators, where the grain is stored.

In the prairies of Canada land is still fairly cheap and the farms are large. A new settler generally takes over a quarter of a square mile and, for the first season or two, has to work really hard, and with very little in the way of comfort. He lives in a small wooden shanty which he has to erect himself from sections made in a distant part of Canada. He has no gas, no electric light, and often no coal, while his only means of obtaining water is from a well that he has dug himself. During the first season he cannot spend much time making his house comfortable, for he has to be busy, out of doors, ploughing up the fertile grass-land ready for his crops.

After a few years, if he is successful, life becomes much pleasanter, and there is no need for him to "rough it." He now lives in a large and pleasant wooden house, with a veran-

THE CULTIVATORS



A settler's home in Alberta.

[Courtesy, Canadian Government.]

da, a tennis court, and a well-laid-out garden. In winter all his rooms are warmed with hot-water pipes and radiators, and he can spend the long, cold evenings listening to his gramophone or to the concerts broadcast from the wireless stations.

We have spoken at length of wheat-growing in Canada. But, as already pointed out, wheat is grown in many parts of the world. The wheat lands are so widely spread that there is always a wheat harvest somewhere, as will be seen from the following table:

Countries of Production.	Harvest arrives in the United Kingdom.
California (U.S.A.)	January-February.
Argentina	February-March.
Oregon and Washington (U.S.A.)	March-April.
Australia, New Zealand, Chile	April-May.
India and Upper Egypt	June-July.
Syria, Persia, India, Mexico, Algeria, Central Asia, Japan, Morocco, Texas (U.S.A.)	July-August.
Kansas (U.S.A.)	August-September.
Central Europe (South Russia), spring-sown wheat in North America, South Canada	October-November.
North Canada and North-west U.S.A.	November.

GROWING WHEAT IN CANADA

Science has helped to spread wheat cultivation widely over the world. Agricultural experts have sorted and tested different kinds of grains, some suitable for lands where summer is short and ripening must be quick, some for drought lands, some for moister regions, and so on.

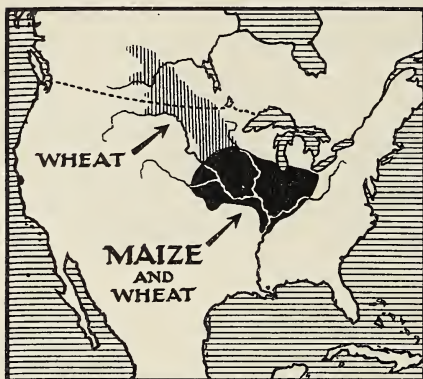
In conclusion we may note one great difference between the cultivation of wheat and of rice. Rice-growing needs much labour and can be carried on usually only where labour is very abundant and cheap. Wheat, on the other hand, can be grown and harvested by the aid of machinery in such a way that little labour is needed in order to produce a very heavy crop.

EXERCISES

1. On a map of the world, drawn to show the chief climatic regions, colour those where wheat is grown. (Use the table on p. 84 and your atlas.) Explain why wheat can be grown in such very different climates as those of Canada, Egypt, Australia, and Britain.
2. If you were to look down from an aeroplane on to the wheat prairies what would be the colour of the landscape you would see (*a*) in winter, (*b*) early spring, (*c*) early summer, and (*d*) in autumn?
3. Show how steam engines, motors, machinery, and steam ships have all helped the wheat growers in the prairies.
4. Draw a map of Canada to show how wheat is sent out of the country. Name the lakes, the rivers, the canals joining the lakes, a famous waterfall, and the chief towns and ports. Put in the railways that carry wheat.

CHAPTER 13

GROWING MAIZE IN THE UNITED STATES



Map of North America, showing the maize- and wheat-growing areas.

THE prairies extend south from Canada, right into the United States of America. In the north, near to Canada, wheat is the chief crop, as it is in Canada: the United States are, in fact, the greatest wheat-growing country in the whole world, though they do not export so much as Canada.

In some other parts of the prairie land, however, it pays the farmers better to grow maize, or “corn” as the Americans call it. This plant needs a hot, damp summer. It reaches to a height of about ten feet, and bears a cob that contains a large number of yellow or reddish seeds, each about as big as a small pea.

So much corn is grown in one region in the United States that the region is called the “corn belt.” In one state, Illinois, the crop, each year, is greater than the total wheat crop of the whole of Canada. During the warm days of July and August thunderstorms bring plenty of rain and the corn shoots up so quickly that the farmers say they can *hear* it grow.

The farms in the corn belt are much smaller than those in

GROWING MAIZE IN THE UNITED STATES



A fine field of maize.

[Ewing Galloway, N.Y.]

the Canadian wheat-land. They are generally just about large enough to be worked by a farmer and his family without any other regular outside help.

Unlike the wheat farmers of Canada, the corn farmers of the United States grow more than one crop and, like the English farmers, they change the crops in each field, year after year, according to a regular plan. They usually grow maize for two years, oats or wheat in the third year, and clover or grass in the fourth. They also keep cattle, large numbers of pigs, and many chickens.

In the corn belt, as in most parts of America, the roads run straight, cut each other at right angles, and divide the land up into squares. Several farmers may be found in the one square mile usually enclosed by the roads. Each farmer has his own homestead, consisting of a whitewashed wooden

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A farmer's homestead.

[Ewing Galloway, N.Y.]

house, surrounded by clumps of trees, together with a number of wooden barns and cattle sheds all painted red. Amongst these buildings there is usually a windmill that pumps water from a well into a raised cistern.

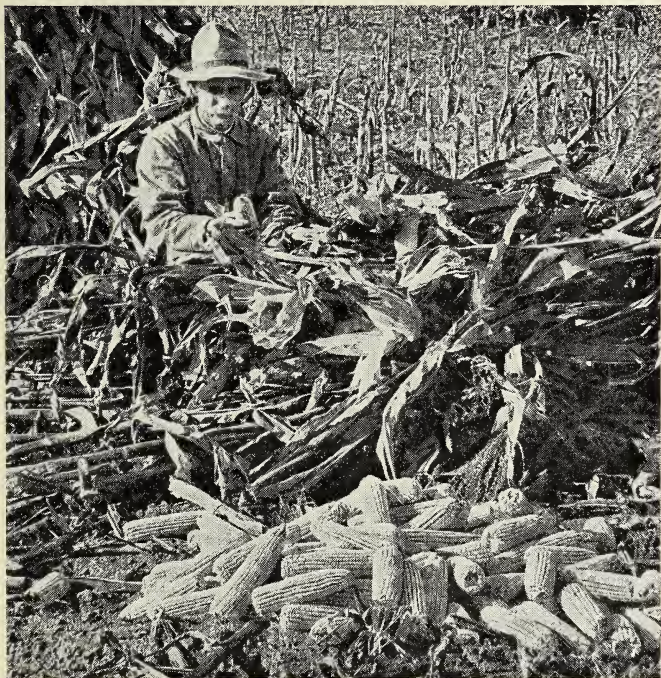
Though the summers of the corn belt are very hot, the winters are very cold, and the ground is frozen hard. Ploughing cannot begin until the thaws of spring, and maize cannot safely be sown till May, because of the possibility of frost; oats, wheat, and grass, however, can be sown earlier.

The wheat and oats are ripe by July, but the maize ripens much later and the time for gathering it depends upon the use to which it is going to be put.

GROWING MAIZE IN THE UNITED STATES

1. The cob may be picked before it is ripe to be eaten as a vegetable by human beings.

2. The whole plant may also be gathered early to be used as a food for cattle. In this case it is cut with a reaper and carted to the barn-yard where it is either fed to the cattle at once or cut up into small pieces and stored in a *silo*. The silo is a tall bin built like a tower. The chopped-up plants, stalks,



Picking the ripe maize cobs.

[Ewing Galloway, N.Y.]

THE CULTIVATORS

husks, and cobs are placed in the silo and kept there for several months. The mass of stalks and leaves makes splendid green food for the cattle during the winter months when fresh grass is difficult to obtain. Because of this great store of food thousands of fully grown steers are sent down every year from the western ranches to be fed and fattened before being taken to the slaughter-houses to be converted into beef.

3. The ripe grain is used, in a number of different ways, as a food for both man and beast. It is ground into flour which is used by white Americans in the making of delicious puddings and cakes and by many of the negroes in the making of bread.

If the grain is to be gathered separately the crop is generally gathered by hand. The farmer snaps off the cobs and tosses them into a wagon, which a horse draws slowly across the field. When the cart is full it is driven off to the farm-yard, where the grain is stored in one of the barns.

Maize is a splendid food for pigs. On most of the farms of the corn belt there are about one hundred of these animals. The Americans call them "hogs." They are born on the farm in the spring time. By the autumn they are nearly large



Hogs feeding in a maize field.

[E.N.A.]

GROWING MAIZE IN THE UNITED STATES

enough to be killed, although they are rather lean. They are then turned into the maize fields and they commence to "hog it down." When the crop has disappeared the animals are fat and can be sent off to the slaughter-houses to be turned into bacon and ham.

We see, then, that in the maize belt the farmers are grain cultivators, but most of the grain that they grow is turned into beef or bacon because it pays them much better to sell meat, fed from the crops, than to sell the crops as grain.

EXERCISES

1. On a map of the United States, showing the separate States, colour the following States one colour—Illinois, Indiana. Call the map, "Map to show the chief corn States."

2. The following table gives the weight in million hundredweights of maize produced in the chief maize-growing countries in 1934 :

United States	.	.	1,195	Russia	.	.	.	96
China	.	.	138	Rumania	.	.	.	91
Brazil	.	.	130	Yugo-Slavia.	.	.	.	71
Argentina	.	.	118	Italy	.	.	.	51
World total, 2,200								

What percentage of the world's crop of maize was produced in the U.S.A.?

3. The following figures give the temperature and rainfall readings at Winnipeg and at St. Louis:

Winnipeg

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	-3	1	15	39	51	62	66	63	54	41	24	7
Rainfall (in.)	.9	.8	1.3	1.6	2.2	3.3	3.2	2.2	1.9	1.4	1.0	.9

St. Louis

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	31	33	43	56	66	75	79	77	70	58	43	35
Rainfall (in.)	2.3	2.6	3.6	3.6	4.5	4.8	3.7	3.5	3.0	2.8	3.0	2.6

- (a) Draw diagrams to represent these figures.
 (b) Briefly describe the climate in summer and in winter at each of these two places.

CHAPTER 14

BANANAS AND DATES

FRUIT is not such an important part of our food as grain, but the doctors keep telling us that if we wish to keep healthy we ought to "eat more fruit." All the lowly hunting peoples eat fruit, just as they find it wild in the forests. The cultivators, however, took these wild fruits, as they took wild grain, and, out of them, produced something much more suited to human needs.

At one time most fruit had to be eaten as soon as it was ripe. It could not be sent to distant lands. No one expected to be able to eat soft fruits, such as plums, peaches, and apricots, except just when they were in season. But in these days Englishmen, for instance, eat oranges and plums from South Africa, apples from New Zealand, peaches from California, and so on all the year round. The reason why this is possible is that by means of cold storage and canning, food can be kept fresh for a very long time.

There are many kinds of fruits, but we can divide them up into those from hot lands, those from sunny lands with winter rain, and those from cool temperate lands.

The chief fruits from the hot lands are bananas and dates.

I. Bananas

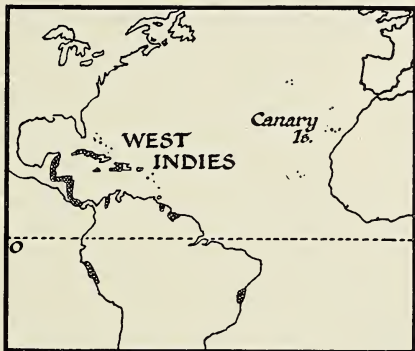
The banana grows in countries that are hot or very warm and where there is plenty of rain. Thus it is found in India, Ceylon, Malaya, and the East and West Indies. The West Indies export more bananas than any other part of the world,

BANANAS AND DATES

and the West Indian island that exports most bananas is Jamaica.

The banana tree looks something like a palm, but it is nothing of the kind.

The stem is underground ; what appears to be a stem is simply ten or twelve leaf stalks rolled tightly round one another, each ending in a huge leaf. Though the plant reaches a height of from eight to twelve or even twenty feet, it never has any branches.



The shaded areas show where bananas are grown for trade.

The banana has no seeds, but the underground stem sends up a number of shoots which can be cut off and planted elsewhere if a new plantation is to be made. Because of the warmth and the moisture, the shoots grow so rapidly that, in six months, they are as tall as a man and in ten months are in flower. Big as they are, they need shelter from rough winds, which easily damage the thick, juicy leaves.

In Jamaica, as in other tropical lands, the white man plans and arranges for the export of crops, but he depends on coloured labourers to do the work of cultivation. The coloured labourers in the West Indies are mostly black negroes whose forefathers were brought as slaves from the west of Africa. They not only work on big plantations that belong to the white man, but they often own small plantations or gardens where they grow large quantities of bananas both for their own use and for sale.

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Most of the fruit is sent to cooler lands in ships that belong to two companies. When one of these ships is nearing a West Indian port, a wireless message is sent out telling the exact time that the ship will arrive. When this message is received at the port, it is telephoned to the head planters on the different plantations, and they are also told how many bunches each is to cut. The planter then calls his negro workers together and the cutting begins.

A cutting gang consists of three men known as the "cutter," the "backer," and the "mule man."

The cutter, with a sharp knife at the end of a long pole, cuts



[E.N.A.]

Native homes on a banana plantation.

BANANAS AND DATES



Gathering bananas.

[E.N.A.]

a gash about half-way up the soft stem. This causes the upper part, bearing the fruit, to topple slowly over. It is steadied by the pole and gently lowered until the bunch rests on the shoulders of the backer. The cutter severs the bunch from the stem and then cuts down the whole plant, leaving it on the ground to rot and enrich the soil.

The backer carries away the bunch—which weighs well over half a hundredweight—to tramlines which run across the estate, and places it on a trolley. When this is full the muleman with his team of mules draws it to a railway, where the fruit is packed into specially ventilated vans.

At the docks the train runs alongside the steamer, and the fruit is carried into the hold of the ship either on the heads of negro women or by a moving canvas belt. So well is the whole business arranged that it is possible to collect and load 75,000

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bunches of bananas within fifteen hours of the first bunch being cut.

In the ships the fruit is stored in rooms whose temperature can be carefully regulated. In the summer these rooms are cooled, and snow can be seen on their sides; in winter, on the contrary, heat has to be supplied to prevent damage by too much chilling.

2. Dates

Some hot lands receive so little rain that they are deserts. Only a few heavy showers can be hoped for during the year;



Map showing where dates are grown.

when these are over, the scorching sun quickly dries up the ground and leaves it parched and barren.

We have already learned how Bushmen hunters and Arab herdsmen manage to live in such lands without cultivating the soil. At first sight it would

seem impossible that there should be any kind of cultivation in lands where there is so little rain. But it happens that, at some places in the desert, there is water under the surface that has come underground from places far away where rain has fallen. If this underground water can be reached by the roots of plants, or raised to be given to the roots of plants, then the desert "blossoms as the rose," for the soil is fertile. Places where water is found in a desert are often like green islands in a yellow sea of sand: they are called *oases*. Some of them

BANANAS AND DATES



A date grove, showing irrigation channels.

[E.N.A.]

are small, but others stretch for miles, and contain towns and villages. The chief plant in all the oases is the date palm, though other things, such as onions, melons, wheat, and barley, may be grown, and if there is grass enough, herds of camels, sheep, and goats may be reared.

The largest date-growing region in the world is Iraq, the lowest part of the basin of two great rivers, the Tigris and the Euphrates. These two rivers unite, after passing the town of Basra, to form one river called the Shat-el-Arab, which then flows through two hundred miles of date groves on its way to the Persian Gulf.

Iraq is really a huge oasis. The water, as in the valley of the Nile, is obtained from the river. From large canals many small ditches and still smaller channels lead the water to and round each tree. In places it is necessary to lift the water. It

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A date palm bearing a fine crop of dates.

[Keystone.]

is then raised, as in Egypt, by the *shaduf*, or, now and then, by a petrol pump.

The date palm is a curious tree. It is thirsty and needs plenty of water, yet rain hurts it and prevents fruit from being formed. It is rather like a bather who enjoys paddling, but objects to wetting his head. The Arabs say it must have "its feet in the water but its head in the fire": the fire is the sun. In Iraq it is planted in straight rows like trees in an orchard. Between the rows the farmer often grows crops of wheat and barley, and enough grass to feed herds of sheep and goats.

There is far more work to be done in a date-grove than you might expect. Every year the oldest leaves die, and have to be cut away. To do this the Arab climbs the palm and hacks

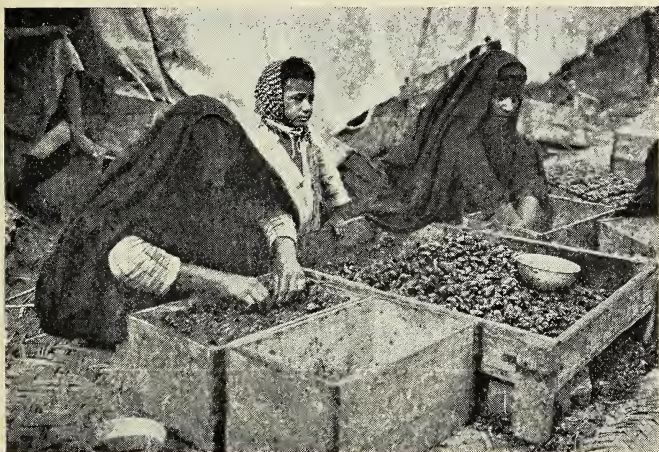
BANANAS AND DATES

through the thick leaf-stalk with a sickle that has an edge like a saw. To help in the climbing he has a strong strap of twisted strips of leather which he passes round the trunk and his own body. He puts his feet against the trunk, pulls himself towards it and jerks up the strap.

Every year the whole surface of the grove must be dug to a depth of about one foot, and about a quarter of it to a depth of four feet and heavily manured. It is impossible to use a plough because of the network of water channels.

At the time of harvest, from August to December, the Arab has to climb the tree again to gather the fruit. He goes aloft with a long rope of plaited palm-leaf fibres and a saw-like sickle. He cuts off the ripe bunches, ties them round with the end of the rope, and lowers them gently to the ground.

Over two million tons of fruit are picked in Iraq during those



Packing dates in wooden boxes for export to Europe.

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three months. To help in gathering the harvest a number of Arabs come from the coast and the desert. For these men the owner of the grove erects dwellings and kitchens as well as shelters where the fruit can be sorted and packed. The buildings are made, not of sun-dried mud, but of tall reeds, twenty feet high, that grow on the edges of the rivers.

Large quantities of dates are eaten by the Arabs themselves, but thousands of tons are exported. Those that are sent eastwards to the rest of Asia are packed either in goat skins or in large baskets made of plaited palm leaves. Those which go westwards into Europe are generally packed in wooden boxes. The sides of these boxes come from Scandinavia already made, and the pieces have only to be nailed together.

EXERCISES

1. Show how the white man has made possible the cultivation of bananas on a large scale.

2. The following table gives the numbers of the different races of people of Jamaica:

Chinese	.	.	.	.	.	.	.	4,000
Negroes	.	.	.	.	.	.	.	660,000
White	.	.	.	.	.	.	.	15,000
East Indians	.	.	.	.	.	.	.	19,000
Half-castes	.	.	.	.	.	.	.	157,000

The Chinese are mainly merchants; the East Indians and negroes are agricultural labourers, and the white people are chiefly organisers and overseers.

What colour do you think most of the following will be:

- (a) Policemen?
- (b) Managers of banana plantations?
- (c) Workers on banana plantations?

3. On a map of the chief natural regions of the world mark and name all the hot deserts.

4. Copy the map of the basin of the Tigris and the Euphrates from your atlas. Mark and name the rivers, the Shat-el-Arab and Basra.



Map of the world, showing the Mediterranean lands.

CHAPTER 15

ORANGES AND GRAPES

IN certain parts of the world there are lands where the summers are hot and dry like those of the desert lands, but not so hot because they are farther from the Equator. The winters, on the other hand, are wet, but though the weather is showery, there is a great deal of sunshine. All these lands lie on the west sides of the continents, and because the chief of them are round the Mediterranean, all are said to have a "Mediterranean climate."

Because they have so much sunshine they are splendidly suited to the growing and drying of fruit. Nearly all the oranges, currants, raisins, prunes, figs, peaches, and grapes come from such "Mediterranean" lands. Because the climate is so much alike in all of them it has been possible to take a fruit, say, from Spain, and grow it in South Africa, California, or Australia. Look at the thin paper wrapped round

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an orange, and you may be able to tell from what part of the world it came.

I. Oranges

In our summer we obtain large quantities of oranges from South Africa, Brazil, and Australia, but during the winter most of them come from a narrow strip of land along the coast in the south-east of Spain. Here there is little rain even in winter, and practically none in summer.

The oranges are grown in orchards, where the trees are planted in rows about twenty feet apart. Strange to say, most of the oranges grow on lemon trees. Lemon pips are sown in pots or boxes, and after four years the small trees are planted out in a nursery. Four years later they are cut short, and twigs from a good orange tree are stuck into the cut and bound round. This is called *grafting*. In time the cut heals up and the new twigs become one with the parent plant and bear fruit.

The year's work in an orange grove in Europe begins in March, when some kind of fertiliser is spread over the ground and turned into the soil. When the trees are small this is done with a light plough, but when they are at their full height, say, eight to ten feet, a horse is unable to pass between the rows, and the men have to dig over the surface with spades. At the same time the earth is banked up into ridges, so that each tree stands in a kind of basin.

Because the weather is so dry the orange groves have to be irrigated. Not far away are some high mountains, from which flow a number of rivers. The water in the rivers is led on to the land by means of canals and ditches. It is allowed, during the summer, to flow into the orange grove once in about every ten days. In early summer the trees have to be pruned. A great deal of wood is cut away, partly to allow air and sunlight to reach the innermost branches.

ORANGES AND GRAPES



[E.N.A.]

Spanish women wrapping oranges for export.

The harvest comes in the winter season, when every branch is weighed down with fruit. A good tree will bear about one thousand oranges, and all the trees seem to have almost as many oranges as leaves. The fruit is often sold to merchants while it is still on the tree. The buyer then sends along his picking party, and men, women, and children all help to gather the fruit. The oranges are picked and placed in heaps at the foot of each tree. Boys with wicker baskets then carry them to a central collecting point, where they are loaded into panniers on a donkey's back, or into a cart drawn by a mule. From the orchard the oranges are taken to a packing warehouse in the town, where each fruit is wrapped in tissue paper and packed in a box that holds one hundredweight. Every year twelve million of these cases are shipped from Valencia and other

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ports on this strip of coast to the British Isles and the other countries in Western Europe.

2. Grapes

Grapes are grown to be eaten fresh, to be dried to form raisins, and to be turned into wine. The vine has very deep roots which can reach down to damp ground even during the hot, dry summer. It is grown in all places that have the "Mediterranean" climate of summer drought and winter rain. Spain and Portugal are amongst the most important countries for grapes. Most of the grapes we eat fresh come from Southern Spain, but nine-tenths of the grapes grown in Spain and Portugal are made into wine.

Let us look at the vineyards of Portugal that produce the wine called *port*. They are to be found in the valley of the Douro. This river flows through a deep, steep-sided valley, and it is on these steep sides that the grapes are grown. They are far too steep to be cultivated in an ordinary way, but the Portuguese have cut them into a series of steps or terraces. The flat part of the step, where the vines are grown, is often two or three yards wide, and is separated from the terraces above and below by a rock wall a few feet in height. Imagine the tremendous amount of work that had to be done to make this area fit to grow grapes!

The ground here does not appear to be at all fertile: it looks as if it were made of a mass of hard, flaky chips, quite unlike the soils that our farmers and gardeners prefer. Yet the ground, like the climate, is excellent for growing grapes.

The vines are planted in rows along the terraces, frequently only one row on each step. Amongst the vines the peasant grows beans, potatoes, and olive trees, and he usually has a small patch which he keeps for growing wheat. The labourers live in a very poor way: they have poor kinds of houses, and

ORANGES AND GRAPES



[E.N.A.]

Picking grapes in a vineyard on the banks of the Douro.

wear clothes that are barely sufficient to keep them warm during the frosty winters that sometimes occur. Their meals, too, are very simple—a roll and a sardine, caught on the Portuguese coast, for breakfast; and a soup made of beans, potatoes, and rice, with a good supply of olive oil and wine, for dinner and supper.

In one of these vineyards there is work enough to keep the peasants busy throughout the whole year, and they are out among the vines almost every day, from dawn to sunset, except in the summer months, when they rest during the heat of the day. The ground has to be kept loose by being dug over with a hoe. In January the vines are pruned. In the summer they produce a number of branches which are all cut off except two short shoots that are allowed to remain. The peasant takes the cuttings home for firewood. As the new branches grow they have to be trained along wire fences so that each bunch of

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[Courtesy, Reid, Pye, Campbell and Hall.]

A wine barge on the River Douro. Notice the huge oar by which it is steered.

grapes can receive its full share of air and sunshine. The vines have to be constantly sprayed to keep away disease. In December the peasant is busy picking and crushing his olives to make olive oil.

The grapes are ready for picking in October, and then all the inhabitants are at work in the vineyards, and other helpers come in from surrounding districts. During the harvest the whole country is dotted with gaily dressed women cutting the grapes, while the men are kept busy carrying the tall hampers down the slopes to the wine-pressing room. Here there is continuous jollity. The grapes are tipped into large stone tanks, or vats, and men with their trousers rolled up can always be seen, and heard, during the vintage, treading, stamping, dancing, and singing to the music of a concertina, up to their knees

ORANGES AND GRAPES

in grape juice. On modern estates machine presses are sometimes used, but most of the grapes are still crushed under the foot of man.

When the juice is all squeezed out it is run into large barrels, called pipes, which are carried in ox carts down to the river. Here they are loaded on to barges, which take them to the large wine cellars of Oporto, the chief wine port of Portugal.

The skins and pips of the grapes are not wasted, for the peasant uses these to feed his chickens.

EXERCISES

1. The following table gives the names of the countries from which we import oranges and the weight of fruit in hundreds of tons (1934):

Spain . . .	2,530	California	} U.S.A. . .	250
Palestine . . .	1,024	Florida		
S. Africa . . .	645	Australia . . .		57
Brazil . . .	610	Cyprus . . .		32
Italy . . .				25

Find the position of these countries in your atlas. Which of these places do not have a "Mediterranean" climate?

What weight of oranges do we get from the British Empire?

2. On a map of the world showing the climatic regions, colour the lands with a "Mediterranean" climate.

3. What is the latitude of Valencia? Name one town that lies near the west coast of each of the following lands and on the same latitude as Valencia—North Africa, South Africa, North America, South America, Asia, Australia, and New Zealand.

Describe the climate that you would expect to find at these places.

4. The following figures give the temperature and rainfall readings at Jerusalem:

Jerusalem

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	44	48	51	59	66	70	73	73	71	67	56	49
Rainfall (in.)	6.2	4.6	3.5	1.5	.3	0.	0	0	0	.4	2.5	5.7

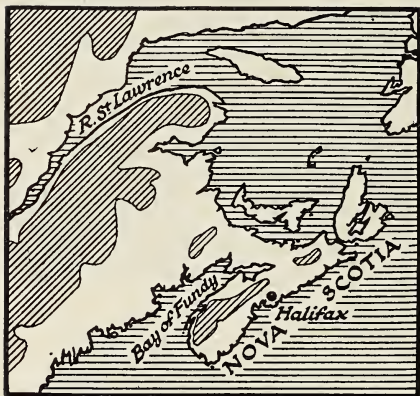
(a) In which of the four seasons does most rain fall?

(b) Contrast the weather in Jerusalem with that in England. London receives an average rainfall of 25 inches during the year. Does Jerusalem get more or less rain than London?

CHAPTER 16

APPLES AND BEANS

I. Apples



Map of Eastern Canada, showing the position of Nova Scotia.

IN cooler countries, like England, the chief fruits are apples, pears, plums, and different kinds of berries. Large quantities of apples are grown in England, but not enough to meet the needs of the people, and a great many have to be imported. Every year five million barrels of apples are received from across

the Atlantic, chiefly from Nova Scotia in Canada.

The chief apple-orchard district is a long, narrow, fertile valley on the west of Nova Scotia. It lies parallel to the Bay of Fundy, and is sheltered by mountains on either side. The farmers are mostly descendants of British colonists and they live and work, to some extent, like British fruit growers. The climate, however, is different. The winters are long and cold; for about three months the ground is covered with snow. At this season the wooden bungalows in which the farmers live are, like most houses in Canada, kept warm by means of hot-

APPLES AND BEANS



[Courtesy, Canadian Government.]

Spraying apple trees to keep away insect pests.

water pipes and radiators. The summers are often hot; the family can then enjoy the airy, shady veranda built along the front of the house.

The farms are usually rather small, very different from the huge wheat farms of the prairies. On them the farmers grow crops and keep cows and chickens for their own use, but their chief business is the growing of apples for export, and that business, if the orchard be a large one, keeps them at work all the year round.

During the winter men mount ladders and prune away old branches from the inner parts of the trees to allow air and sunlight to enter more freely.

In spring, when the snow melts, manure is spread over the ground, and the land between the rows of trees is ploughed.

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Picking the apples.

[Courtesy, Canadian Government.]

This turns in the fertiliser and allows moisture and air to reach the roots. When the ground is nicely broken up, clover is sometimes sown. This enriches the soil and the flowers give food to bees; most of the growers keep a few hives of bees to carry pollen from one apple flower to another to produce the fruit.

In the spring, too, the trees are sprayed with a liquid that kills insects, otherwise caterpillars and other grubs would spoil a large number of the apples. It would take too long to spray hundreds of trees in an orchard with an ordinary syringe, so a motor pump is used on most farms. It is a strange sight to see the men at this work; they wear mackintosh coats, waterproof hats, and rubber gloves, and even the horse that draws the pump has a mackintosh covering. The trees are also sprayed at short intervals throughout the summer.

In May, when the trees are in blossom, the orchards are a beautiful sight, and the grower prays for fine weather; if it is cold the bees remain in their hives, and if it is windy the flowers are destroyed before they can be fertilised.

APPLES AND BEANS

In September the apples are ripe, and then comes the busy time. During this period many fishermen leave the coast and go to the valley, and school-children have a long holiday that they may help in the picking. The pickers spend most of their time on ladders placed amongst the branches. They pick the fruit and place the apples in baskets, each of which holds about twenty pounds. When these are full the men come down the ladder and gently tip the apples into a barrel. As the barrels are filled they are carted off to the sorting house, where each apple is inspected to see that it is sound. The damaged ones are thrown aside, while the good ones, sorted either by hand or by machine into three sizes, are packed in separate barrels. The harvest continues for about two months, but well into the new year the packers are busy grading, wrapping, and firmly packing the apples so that they will not jolt and become bruised on their long voyage.

From the packing sheds the filled boxes and barrels are taken to Halifax, the chief port in Nova Scotia, where they are lowered into the holds of ships bound for Liverpool, London, or Southampton.

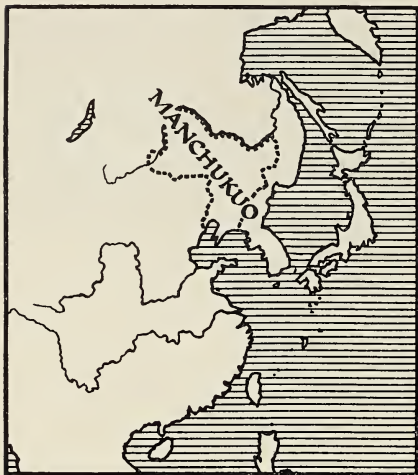
2. Beans

In the east of Asia there is a land, now called Manchukuo, which is about as far from the Equator as Nova Scotia. It has a similar climate; the summers are rather hot and damp, while the winters are intensely cold. For about five months the land is white with a thin mantle of snow, and the rivers are covered with ice two or more feet in thickness.

Part of Manchukuo is hilly, but there are vast fertile plains that make splendid farming country. The chief crops are millet and a kind of bean called the soya bean. The farmers are mostly Chinese who have emigrated to Manchukuo, as Britons and others have migrated to Nova Scotia and other parts of Canada.

THE CULTIVATORS

We have seen how overcrowded is the land of China. Because of this, and because the peasants were so often troubled with civil wars and with bandits, hundreds of thousands of them



Map of Eastern Asia, showing the position of Manchukuo, north of China.

have gone northwards into the fertile plains of Manchukuo.

These colonists settled on the grasslands and turned them into farms in the same way that early settlers opened up the prairies of Canada. They were given land and told where their village was to be. For the first year they were provided with most of the things they needed, but they had to build their own houses. They dug

out some of the clayey soil to make sun-dried bricks for the walls; timber was supplied to them to finish the rest of the house. They were also given a simple wooden plough and animals to pull it—either horses, mules, or oxen.

One of the chief crops, millet, is largely grown for food, but no part of the plant is wasted. The long leaves are woven into mats and sacking; the stout stalks are used for fences and for building farm sheds, and the roots are burned for fuel.

The most important crop, however, is the soya bean. From it are obtained a valuable oil for cooking and lighting, and a

APPLES AND BEANS



A Manchukuo farmer ploughing.

[E.N.A.]

fertiliser that is sent to Japan in large quantities. In other lands the beans are made into flour and bread, or roasted and sold as coffee beans. The oil is used to grease machinery, for salad dressing, and in the manufacture of margarine, celluloid, linoleum, paint, ink, soap, and waterproof. Thousands of tons of soya beans are exported every year.

The farmers, who grow the beans, have no big machines like those used by the wheat growers of the prairie. The farms are small, and most of the work is done by hand.

In spring, when the thaw sets in, the farmers plough up the land. When this is finished they fix a spike in front of the plough, and cut a gully along the crest of the ridges turned up by the plough. Another peasant follows the ploughman, planting seeds by hand in the little trench. A third man with a basket of manure on his arm puts a little fertiliser round each seed. When the field has been sown a heavy stone roller is drawn over it to press the seeds firmly into the soil. The Chinese farmers cultivate their new farms in Manchukuo as carefully as they did their tiny patches of land in China.

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By the end of summer the beans have grown to about two feet in height and bear a number of pods, each containing two or three bean seeds. When the pods look dry and withered,



[From *The Soya Bean*, by E. M. Bowdidge.

A dried soya bean plant.

the farmer pulls up the plants, loads them on to a farm wagon, and carries them away to a hard piece of ground where the seeds are threshed out of the pods in one of several different ways. Sometimes the farmers themselves do it with flails; sometimes the plants are spread over the ground, and a farm animal drags a heavy roller over them; sometimes a mule trots about on them for an hour or two.

When the threshing is completed the stalks are gathered up and stacked for winter fuel, and the beans are placed in sacks.

The farmers themselves eat large quantities of these beans prepared in different ways. They eat them boiled; they make soup from them; they squeeze the boiled beans through small holes to make a kind of macaroni, and they make them into bean curd, which looks like cream cheese. Most of the crop, however, is exported.

As many of the farms lie far away from a railway the produce has to be carried in carts for many miles. This is difficult, for most of the roads are exceedingly bad, being just worn-down tracks. In summer they cannot be used without fear of the

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Soya beans in storage.

horse being drowned in the mud. In winter travelling is easier; the ground is frozen, and thousands of springless farm carts stream along the hard but rutty roads to the railway. In each cart are sacks of millet, rolls of dogs' skins, which the farmers rear on the farms for furs, bundles of millet stalks, and sacks of beans, all covered with millet leaf matting, while strapped on the side of each cart may be one or two frozen pigs.

At the railway the beans are loaded into a train and taken to the port of Dairen. Here some of the beans are crushed in up-to-date mills and the oil stored in large vats until a fleet of special oil-carrying ships carries it away. Dairen is a wonderful sight at this time of the year. Acres and acres of land are covered with stacks of bags full of beans; loose beans are stored in great baskets, made of millet matting, almost as large as

THE CULTIVATORS

gasometers ; and there are piles of bean cakes, each as large as a motor-car wheel, piled up like giant draughtsmen. Ships carry this produce to the countries of Europe, where the beans are sent to crushing mills, the cake is fed to cattle, and the oil used in margarine and soap works.

EXERCISES

1. Draw a map of north-eastern North America to show the coast from Philadelphia to Labrador. Name four islands, two inlets, and one strait. Insert and name the river St. Lawrence and the river Hudson. Name, and make a dot to show the position of, four towns in Canada and four in the United States.

2. The following table gives the weight in thousand tons of apples imported into the United Kingdom, and the names of the countries from which they come: (1934)

Canada	125	New Zealand	23
Australia	76	France	2
United States	65	South Africa	2

(a) From what continent do we receive most apples? (b) Some apples reach England about midsummer. Where do these come from? (c) What weight of apples comes from the British Empire?

3. Draw a map of North-eastern Asia. Name China, Manchukuo, Korea, Siberia, and Japan. Insert and name the Hwang-ho, the river Amur, and the Sungari. Name the Sea of Japan, the Yellow Sea, and the Gulf of Pe-chi-li. Name and make a dot to show the positions of Peking, Mukden, Newchang, Dairen, Vladivostok, and Tokyo.

4. On a map of the world showing the climatic regions, colour the two regions dealt with in this chapter.

5. The following figures give the temperature and rainfall readings at Vladivostok and Halifax:

Vladivostok

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	5	12	26	39	49	57	66	69	61	49	30	14
Rainfall (in.)	·1	·2	·3	1·2	1·3	1·5	2·2	3·5	2·4	1·6	·5	·2

Halifax (Nova Scotia)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	24	24	31	40	49	58	65	65	59	49	40	29
Rainfall (in.)	6·0	4·7	5·1	4·6	3·8	3·8	3·7	4·6	4·1	5·5	5·9	5·5

(a) Describe the winter and the summer weather in each of these two places. (b) For about how many weeks is the temperature below freezing at each of these places? (c) Point out the main differences between the climates of Vladivostok and Halifax.



[E.N.A.]

Splitting coco-nuts open so that they may dry in the sun and become copra.

CHAPTER 17

COCO-NUTS AND RUBBER

THE two plants dealt with in this chapter need a climate very different from that suitable for apples and beans. Their homeland is in countries that lie near the Equator, where the temperature is always high and the air is always damp. The constant rain and heat favour the growth of dense forests, such as those in which we have found the pygmies of Africa and the Punans of Borneo.

The interiors of these forests have few people, and send few products to the rest of the world. But on the coasts there are

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Coco-nuts are grown near the sea in all the lands lying between the dotted lines.

valuable products that are exported in large quantities. One of these is the *coco-nut*.

1. The Coco-nut

The coco-nut palm is a very useful tree in the lands where it grows. The trunks are used in building houses, the leaves for thatching the roofs, the centre leaf-stalks for fencing and fuel. The fibre that surrounds the kernel is made into rope, matting, stuffing for mattresses, and bristles for brushes. The shells may become cups, combs, or fuel. The milk can be drunk and the flesh eaten.

To the white man the coco-nut is valuable chiefly for an oil obtained from the dried flesh, or *copra*. This oil is used in the manufacture of nut-butter, margarine, soap, candles, and brilliantine.

The chief country producing coco-nuts for commerce is Ceylon, parts of which have a climate very much like that of

COCO-NUTS AND RUBBER

the hot, wet forests. The plantations are in the south-west, the wettest part of the island. The trees are grown from nuts, bear fruit when they are six or seven years old, and die when they are from eighty to a hundred years old. When they are young they need a great deal of care, and even when they are fully grown the plantation has to be ploughed to free it from weeds and enriched with different kinds of manure.

The chief work on the plantations is the cutting down of the nuts. This must be done before they are ripe; if they fall they are likely to kill anyone passing underneath. The cutters, who climb the trees, usually work for a number of people, and go round, from time to time, to see if there is anything for them to do.



[E.N.A.]

A main road in Ceylon, with coco-nut palms growing on either side.

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After the coco-nuts have been gathered, they are husked by striking them sharply on an iron-pointed stake fixed upright in the ground, after which the fibre is torn off by hand.



[Keystone.

A coco-nut palm, showing the coco-nuts growing.

The nut is then cracked with a hatchet and the flesh is taken out to be dried either in the sun or, by means of fires, in a drying shed. To obtain the oil the dried flesh, or copra, must be squeezed in some kind of press. The copra may be packed in bags and sent to factories in Europe, but much of it is crushed by machinery in factories in Ceylon. The refuse, which is left after the oil has been squeezed out, is used in the island as food for cattle

and poultry, and as manure for the soil, or exported as cattle cake.

The Singhalese are a civilised people, with a written language, fine temples, and a knowledge of metal work. This is due partly to the fact that they are much better farmers than, for instance, those of West Africa. As the plantations are mostly small, the owner must have some other way of making a living. He may be a fisherman, a rice grower, a worker on the railway, or if he is educated, a clerk, a doctor, or a lawyer. Very often,

COCO-NUTS AND RUBBER

besides his plantation, he has a garden in which the chief plant is the banana.

On the plantations, usually near the road, stands the house. The commonest kind of house is one storey high, whitewashed outside, and thatched with coco-nut leaves, though the owner prefers tiles, if he can afford them. Outside it is the veranda, which is used as a sitting-room, a dining-room, and, among the poor, as a bedroom for the boys of the family. Inside there are at least two rooms, one for a kitchen and storeroom and one for a bedroom. There is very little furniture, because most kinds of wood are eaten by some insect or other. The mother and baby have a bed, but the rest of the family sleep on palm-leaf mats on the floor. It is also the custom to sit cross-legged, on the floor, on palm-leaf or coco-nut mats.

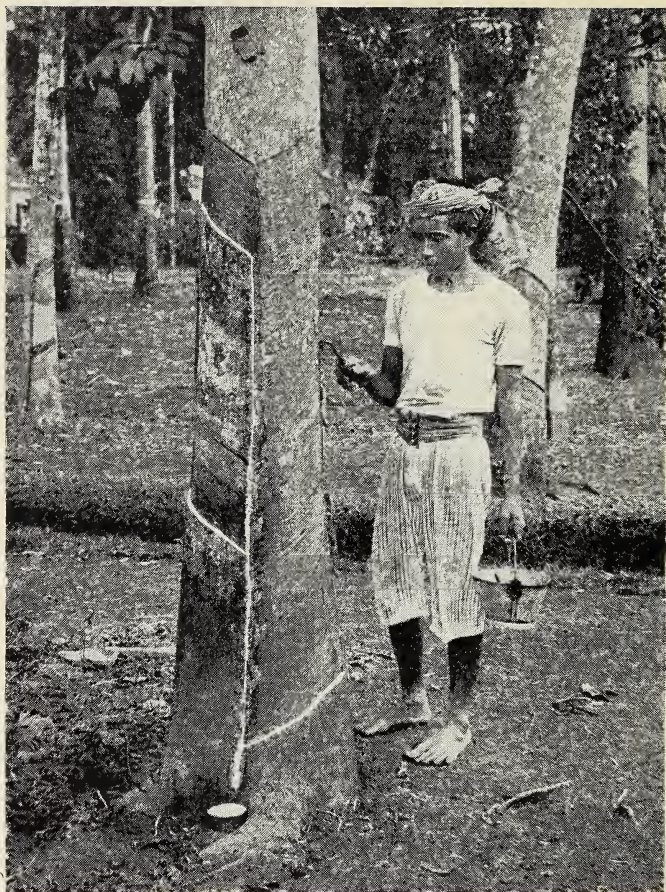
Because the plantations are in a part of the island where many people live, there are quite a number of little towns or large villages. In the main street are the shops, open to the air and the public, with the goods spread out on low stands.

It is important to notice that most of the plantations in Ceylon are owned and worked by the Singhalese themselves, and not managed by white men, as are the banana plantations in Jamaica. But the white man has created the market and buys the copra.

2. Rubber

In the case of another plantation product, rubber, the plantations are owned by the white man, who employs coloured people, chiefly Tamils from Southern India, to work for him. If we think of the history of rubber we may see some reason for this difference. At one time most of the rubber used by white men came from wild trees growing in the forests of the Amazon. It was of very good quality, but as the trees, in their natural

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[Ewing Galloway, N.Y.]

A worker on a rubber plantation in Malaya collecting latex.

COCO-NUTS AND RUBBER

state, are very scattered, it took a native a long time to find them, and he often obtained only a small amount of rubber after a day's hard toil. In the evening he would smoke what he had collected over a fire and make it into a ball. When he had made enough balls he would take them in his canoe and sell them at some place where there was a rubber merchant or his agent.

After the invention of the motor-car, when there was a huge demand for rubber for motor tyres, the supply from the Amazon was not big enough. Moreover, the native collectors could not deliver it regularly, and it was too dear. It was necessary to find some way of obtaining large amounts, at regular times, at low cost.

Seeds were collected in the Amazon forests, and plantations made in other lands with the same kind of climate. The most important of these lands, to-day, are Malaya which, like Ceylon, is a part of the British Empire, and some of the islands of the East Indies. The forests were cut down, and much money was spent in planting, building factories, and making roads.

The trees are grown from seed. When they are about five years old their upper branches interlock, as in the forest, but there is often no undergrowth; the plantation may be carefully weeded, as in Malaya, or planted with something that binds the ground together, as in the East Indies. The rubber is obtained from a milky fluid, called *latex*, that flows just underneath the bark. With a sharp knife, slanting cuts are made through the bark. The latex oozes out, flows down the grooves, and is collected in a metal or enamel cup.

The milk from the cups is poured into pails and carried to a factory, where it is made into hard, tough sheets.

EXERCISES

1. From other books write an account of the coco-nut palm.
2. Describe a coco-nut in its original state (only the kernel is shown in the shops).

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3. A poet has said:

“ The palm to him is a thing divine
Wherein all manner of gifts combine
Food and raiment and house and wine.”

Explain what is meant by this.

4. Find out all you can about the collectors of rubber in the Amazon Forest.

5. Find out all you can about life on a Malay rubber plantation.

6. Explain why there has been a great increase in the demand for rubber and for coco-nuts during the last thirty years. Why were rubber seeds taken from Brazil to Ceylon and Malaya? Why was it not necessary to take coco-nut seeds from one country to another?

7. The following table gives the export of rubber in thousands of tons: (1933)

Malaya . . .	582	Borneo . . .	20
Dutch East Indies . .	340	Indo-China . .	18
Ceylon . . .	66	Brazil . . .	9

(a) From which continent is most rubber exported?

(b) How much rubber is exported from the British Empire? Represent these figures by a diagram.

8. Mark the places mentioned in Question 7 on a map showing the climatic regions of the earth.

9. The following table gives the monthly temperature and rainfall readings at Singapore:

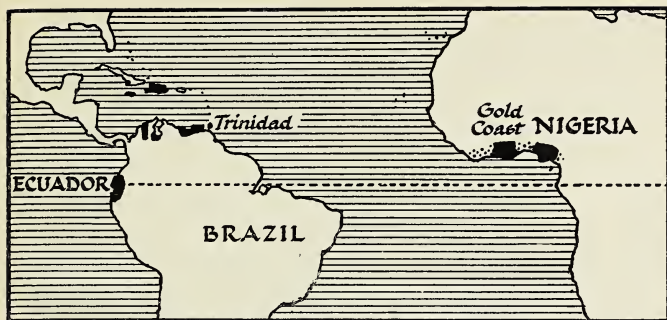
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (°F.)	78	79	80	81	82	81	81	81	80	80	79	79
Rainfall (in.)	8.5	6.1	6.5	6.9	7.2	6.7	6.8	8.5	7.1	8.2	10.0	10.4

Represent these figures by diagrams.

(a) What is the difference between the hottest and the coolest month?

(b) In London the average temperature in July is 63° F. What is the average temperature at Singapore?

(c) The average annual rainfall in London is 25 inches. What is the rainfall at Singapore? How many times is it greater than in London?



Map showing the chief cocoa-producing regions.

CHAPTER 18

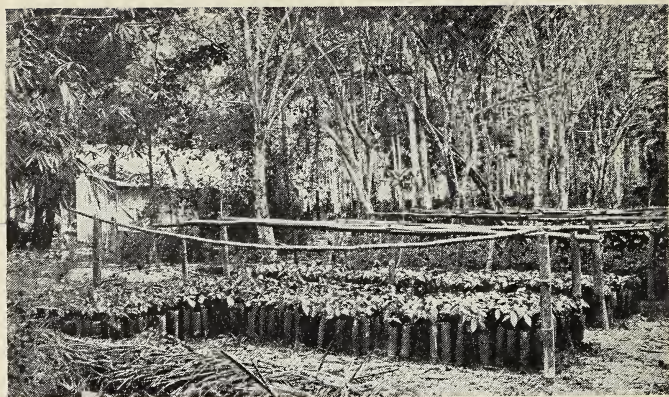
COCOA AND COFFEE

I. Cocoa

IN Chapter 9 we read of the Kaffirs, an African tribe who learned hoeing and herding to provide food only for their own use. In Chapter 14 we saw African negroes in Jamaica working on plantations, often under a white employer. In this chapter we shall study an African people who have learned to cultivate their own land in order to sell their crops to the white man. The negroes own the plantations, and the white man has nothing to do with the business except to buy what the black man grows.

As a rule the things that are grown, on a large scale, in hot, wet lands are grown to meet the needs, not of the native peoples, but of white manufacturers. This we have seen to be the case with coco-nuts and rubber. It is even more true in the case of cocoa. More than half the world's supply of

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[Courtesy, Cadbury Bros. Ltd.]
Cocoa seedlings growing in bamboo pots.

cocoa comes from the Gold Coast and Nigeria in West Africa, yet less than fifty years ago no cocoa was exported from these countries.

The negro cocoa grower first cuts down all the low bushes and the smaller trees and sets fire to the lot. He often, however, leaves big trees standing to shelter young plants from wind and shade them from the fierce rays of the burning sun. He then grubs up the roots of the trees that he has felled.

The good cocoa planter sows seeds in a nursery which consists of a large number of "pots," each of which is a piece of the hollow stem of a bamboo. The careless farmer simply scatters his seed on a piece of ground that he has dug up with a hoe.

As soon as the seedlings are strong enough they are planted, often at equal distances from each other. They grow into small trees about as big as ordinary apple trees.

When the cocoa tree is about four or five years old it begins

COCOA AND COFFEE

to bear little pale pink and yellow flowers, out of which grow pods that are red, purple, yellow, or green.

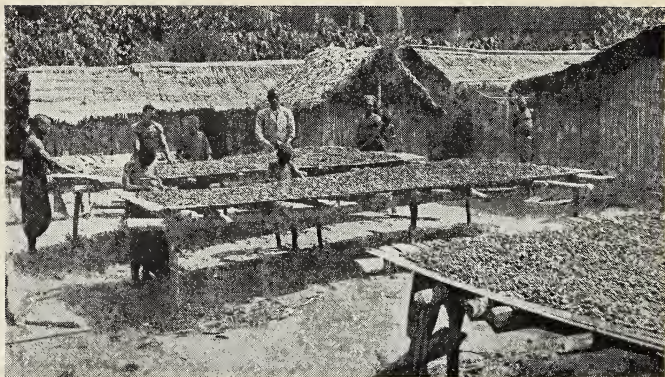
The pods hang from the branches and the trunks of the trees by little stems each about an inch long, and, at the time of harvest, they are cut off the trees by men, women, and children. Those that are low down are removed with a big knife, those high up with a kind of steel hand at the end of a long, light pole, usually of bamboo. The pods fall on the ground and are picked up by women and children. They are put into baskets which are carried on the head to a clearing in the forest where they are emptied into one big heap. Round this heap gathers a family party, for all the workers on the plantation are either the family of the farmer or his relations. They sit down in two rings or half rings, the men nearest the pile of pods, the women



[Courtesy, Cadbury Bros., Ltd.]

Harvesting cocoa. The man on the right is cutting off the pods that grow low down. The man on the left cuts those that grow high up.

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[Courtesy, Cadbury Bros., Ltd.]

Cocoa beans spread on platforms to dry in the sun.

outside. The men slash the pods open with their knives, the women scoop out, with a wooden spoon, a number of seeds about as big as almonds, that are called cocoa beans.

Cocoa, as we buy it, is in the form of a powder, but the beans cannot be ground before they have been dried. The drying is done in Africa, the grinding in some other land, probably in Europe or America.

As a rule, on the Gold Coast, the beans are dried near the farmer's house on little platforms, the legs of which are rough pieces of wood, while the top is of the split ribs of the palm leaf. On the top is laid a mat of plaited grass, and on this the beans are spread.

When they are ready for market they are put into sacks to be taken to the buyers. This is more easily said than done. No horses or bullocks can be used because in West Africa there is a fly, the tse-tse fly, that kills them. In most places there are now railways or roads along which motor trucks run, but some

COCOA AND COFFEE

of the cocoa farms are far away from them. In bygone days the cocoa was sometimes put in barrels and rolled! But the commonest way of moving it, when there is neither rail nor road, is to carry it on the head.

The buyer sends the cocoa to the railway, which carries it to the coast to be put on ships at ports like Accra, Lagos, and Takoradi.

2. Coffee

We have just seen native Africans at work growing cocoa for the white man's markets. Now we are going to look at a region quite close to the tropics where a crop is grown, strangely enough, by white people. The crop is coffee, and the most important region is the south-east corner of Brazil. Two-thirds of all the coffee produced in the world come from this one area.

From the Atlantic coast the land rises steeply to the plateau of Brazil, and here, on the reddish-coloured, gently sloping hillsides, are millions of coffee trees.

The plants are grown from seed in a shady part of the estate. They are reared in wicker baskets until they are big enough to be planted out in straight rows over the plantation. On such a plantation nothing can be seen for miles but these long lines of small trees with avenues of red soil in between.

After about four years the trees bear fruit; this looks very much like a small red cherry. Inside the skin is a mass of sticky white pulp surrounding two coffee beans which are held together by another thin skin.

The berries ripen in the dry season, that is, in the winter months from May to August. During this time all hands are hard at work plucking the red berries from the bushes. Strangely, although at one time Brazil was a Portuguese colony and Brazilians still speak the Portuguese language, most of the labourers on the coffee estates are Italians.

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They live in a village of bungalows near the planter's solidly built mansion. They have their own shops and their own place of worship. Each family has its own little patch of ground



Map showing the chief coffee-growing regions.

on which maize and beans are grown, and a few goats and pigs are kept for food. At a short distance from this colony is the manager's house, a big, strong building of stone or concrete with wide, shady verandas and a beautiful garden. In this part of the estate are also the stables, stores, and factory.

On a large estate it is a long walk from the Italian village to a distant part of the plantation, and, during the harvest time, the labourers set off soon after sunrise and do not return till after dark.

To pick the coffee the boughs are pulled down and held with the left hand while the right hand is run along the branch. This strips off the berries and many leaves, all of which fall to the ground. Coffee trees grow to a height of about twelve feet, so that ladders have to be used to reach the fruit on the upper branches. When there are no more coffee berries on the tree those on the ground are raked together into a heap. Handfuls are then placed in a sieve, shaken, and thrown once or twice into the air. The dirt falls through the sieve, the leaves are blown away by the breeze, and the berries are put into a sack which is taken away by a wagon.

COCOA AND COFFEE



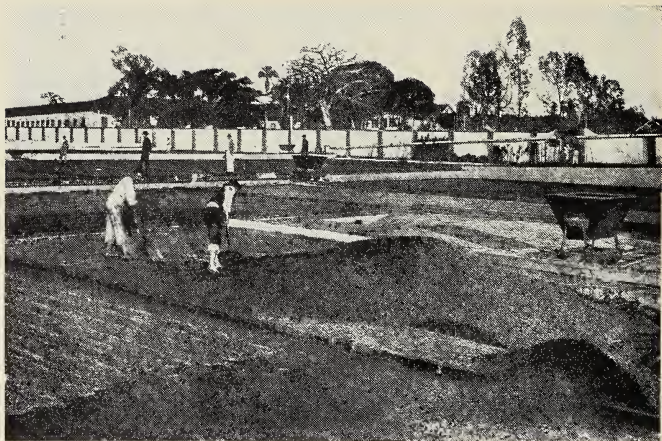
Italian workers picking coffee.

[Courtesy, Express Coffee Co.]

The wagon carries the sacks to a cement channel that has been made down the hillside and along which a rapid stream of water flows. The men tip the berries into the water and the water swirls the berries away to the factory below. Outside the factory the coffee is shot into a big tank of water, which is stirred up with rakes. Those berries that are unripe or are too dry float on the surface and are raked into another tank for further soaking. After a good washing the others are allowed to pass on with the stream.

The berries must next be freed from the pulp that surrounds them and the thin skin that holds them together. They are carried by a stream of water into a machine where a rough kind of roller breaks up the pulp and frees the beans. The stream

THE CULTIVATORS



Coffee beans spread to dry in the sun.

[E.N.A.]

of water carries the pulpy mass over a grating through which the beans fall into a tank. There they rest for a day or two until all the bits of pulp have floated away. A door in the tank is then opened and the berries are swirled away to the drying floors. Men with wooden shovels scoop the beans into wheelbarrows and spread them over a large cemented area to dry in the sun. The manager of the estate spends much of his time here, for the quality of the coffee depends very largely upon the degree to which the beans are dried. Under his orders men are busy all day long spreading beans, turning them over with rakes, piling them into heaps, and wheeling them away when they are sufficiently dry.

The beans are still held together in pairs by the thin skins; to remove these they have to go through yet another machine, in which they are separated, while a strong draught carries

COCOA AND COFFEE

away the skin and quantities of dirt and dust. Finally the beans are graded, packed into bags each containing 132 pounds, and carried in lorries or in wagons to the nearest railway station, whence they are sent to Santos, the great coffee port of Brazil.

EXERCISES

1. The chief cocoa- and coffee-producing countries are given below, with the weight of the crop in thousands of tons (1934) :

Cocoa.		Coffee.	
Gold Coast	211	Brazil	860
Brazil	90	Colombia	203
Nigeria	69	Dutch East Indies	106
Ivory Coast	32	Venezuela	57
Haiti	22	Guatemala	48
Ecuador	17	Salvador	45

Mark these countries on a map of the world by making little circles to represent coffee and crosses for cocoa.

2. The following figures show the growth in the export of cocoa from the Gold Coast. Draw a graph to show this great development.

Tons.		Tons.	
1890	0	1920	127,000
1895	13	1925	217,000
1905	5,600	1930	190,000
1910	23,000	1935	230,000
1915	79,000		

3. The sun is vertically over the Tropic of Cancer at midday on June 21st, over the Tropic of Cancer at midday on December 21st, and over the Equator on March 21st and September 22nd.

In which direction will the shadow of an upright flagstaff erected at Lagos point at noon (*a*) on Christmas Day, (*b*) on the last day of the summer term, (*c*) April 6th, and on (*d*) Midsummer day?

(On one of these days the sun is right overhead.)

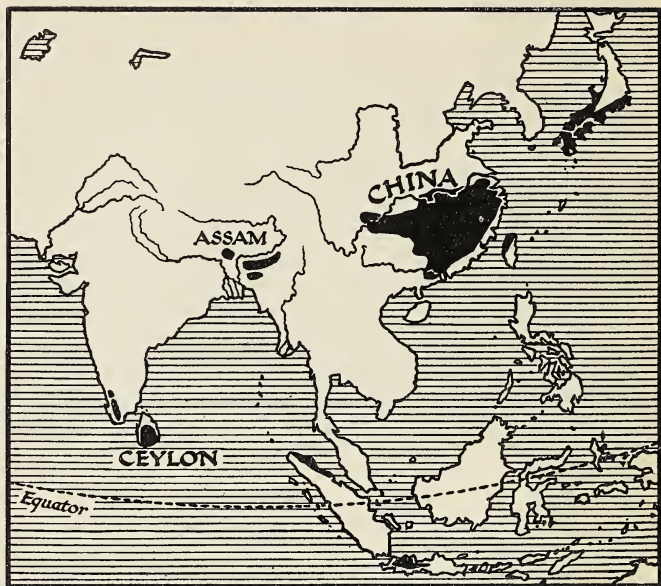
4. The following table gives the temperature and rainfall readings at Sao Paulo in South-eastern Brazil.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature (° F.)	71	71	70	66	61	58	58	60	62	65	67	70
Rainfall (in.)	8.2	8.1	5.9	2.6	3.0	2.6	0.8	2.1	3.2	4.8	4.5	6.1

Represent these figures by a diagram.

Which months are the hottest?

Describe briefly the weather experienced in January (summer) and in July (winter).



Map of South-eastern Asia, showing the tea-producing areas.

CHAPTER 19

TEA AND SUGAR

I. Tea

TEA was known and used, in very early times, among the highly civilised Chinese, and for a long time the tea drunk in Britain all came from China. Then the British began to plan to grow it in lands ruled by themselves.

As it thrives in the hilly regions of monsoon lands it could be introduced into India and Ceylon. Much of the tea drunk in

TEA AND SUGAR

England now comes from Assam, a mountainous country in the north-east of India. It was in this region that the wild tea plant was found in 1834 and here that the first British tea plantation was made.

The tea plantations of Assam are, like the rubber plantations of Malaya, managed by white men, but the labourers are coloured people. These labourers, however, are not natives of Assam, but of other parts of India. The Assamese can easily grow all the food they need, so they will not work as coolies on plantations. Many Indian peasants, on the other hand, are very poor and are glad to go as coolies to Assam. After a few years' work, if they save their wages, as they usually do, they return to their own villages.

Though the tea plant needs the kind of heat and the amount of rain usual in monsoon lands it is injured if water is allowed to stand round the roots. Hence, at one time, it was always grown on steep slopes which allowed the water to run away. Nowadays it may also be grown on flat land if proper drainage is arranged, but this, of course, adds to the cost.

The young tea plants, like so many other crops, are grown in a nursery. This is often in a damp and shady dell to keep off the scorching sun, and is fenced round to keep off wild animals. After the ground has been well hoed the seed is sown and the beds are covered with straw as a further protection against heat.

While the seedlings are growing the rest of the estate is prepared. Bushes are grubbed up, the land is well hoed, and drains and pathways are made. When the young plants are about six months old and about a foot high they are carefully planted out in straight lines with gaps of about five feet between each pair of plants.

For the first two years there is no profit from a tea plantation because the tea shrubs are not big enough for their leaves to

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[From the Imperial Institute Collections.]

Planting tea seedlings on a tea estate.

be picked. All this time, however, work has to be done. Manure is dug into the soil, ditches and drains are cleaned out, the ground is hoed to allow air to reach the roots, and weeds are removed with a kind of rake.

The people who look after the tea plantation live in a kind of village all to themselves. There is a handsome bungalow for the manager, a well-built barrack for the assistants who are learning the art of tea growing, and lines of huts for the coolies, who do all the hard work. These huts are made of sticks plastered over with mud and roofed with thatch resting on rafters of bamboo.

When the tea shrubs are two years old the leaves can be picked. Work begins very early in the morning. Long before

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it is light the watchman blows his horn to awake everyone. By half-past four fires are flickering on the earthen floors and the labourers eat their breakfast of rice and curry.

At sunrise, in answer to another sound of the horn, the coolies fall in near their huts for roll call. They are then told what work they have to do and in what part of the plantation they have to do it. Men, women, and children all help, and they go off in groups up the mountain slopes to their different jobs. The men are mainly engaged in pruning, the women in plucking the leaves, and the children in hoeing up the weeds.

If the tea shrub were left to itself it would become a tree about forty feet in height. Picking the leaves would then be very difficult. Hence the plant is cut back now and again and never allowed to reach a height of more than six feet.

The leaves grow so quickly in the hot, wet climate that they



[From the Imperial Institute Collections.]

Girls picking tea.

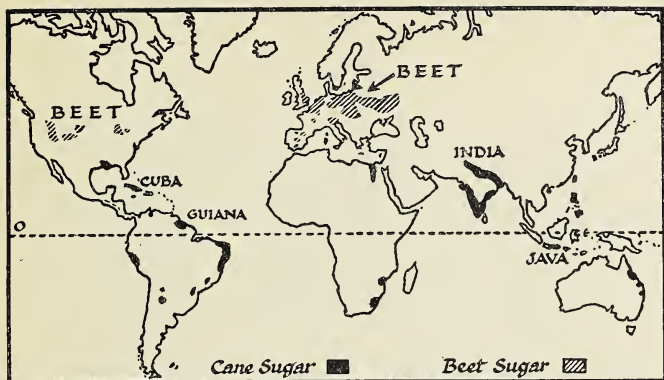
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can be plucked every two or three weeks. The quality of the tea largely depends upon what leaves are gathered. For the more expensive kinds only the bud and one or two of the young and tender leaves are plucked. The speed with which a picker works is truly surprising. Practice has made her eyes keen and her fingers nimble. She seizes one stalk after another, always in the right place, snaps it off, and tosses the leaves over her shoulders into a large basket that hangs at her back, supported by a band passing across the forehead. Two or three times a day the women take their baskets to one of the overseers who measures the contents and books the quantity in a note-book, for the coolies are paid according to the quantity of leaves they pick.

It is not always an easy matter to carry the baskets of leaves to the factory where the tea is prepared. On a very hilly plantation it is often done by means of overhead wires that run down the hillsides. The baskets are emptied into a sack; the sack is fastened to a small trolley that runs along the wire, and away it goes, by itself, to the factory, a long two-storey building generally situated near the planter's house.

The tea is taken to the upper room, which is fitted with racks that hold rows and rows of trays reaching from the floor to the ceiling. All day long men are busy spreading leaves on these shallow trays, the bottoms of which are made of wire netting. As the warm air moves over the leaves they lose their moisture and begin to wither. After about eighteen hours they are removed from the racks and sent down a chute to the ground floor. Here they pass under rollers that bruise them and break up the oil cells, they are sprinkled with water and left for an hour or more till they change colour, and finally they are baked in hot air until they are thoroughly dry. They are then taken to the sorting room where they are sifted into different sizes and packed into lead-lined chests for export.

TEA AND SUGAR



Map of the world, showing where sugar is grown.

2. Sugar

Many plants contain sugar, but the two from which sugar for commerce is made are the sugar beet and the sugar cane. The sugar beet is something like a turnip and is grown in North America, Europe, and the British Isles. The sugar cane is a kind of grass and is grown in very warm countries like the West and East Indies and India. There is no difference in the manufactured sugar: whether it has been made from beet or cane it looks and tastes just the same.

Sugar cane needs a great deal of attention and can only be grown profitably where the wages paid to the labourers are rather low. This cheap labour in the West Indies was supplied, many years ago, by slaves brought over from Africa. Nowadays the managers of the estates are generally white men, but the hard work in the fields is done either by the descendants of the negro slaves or by men and women who come over from the East Indies to work for a few years in

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Cutting sugar cane.

[Fox Photos.]

the islands of the West Indies. One of the chief cane-sugar countries is Cuba, an island in the West Indies.

Sugar is never grown from seed, but from cuttings. After a field has been ploughed and turned into furrows and ridges pieces of cane are laid in the troughs and covered with soil. In time a new cane grows up to a height of from twelve to twenty feet. It looks something like a piece of bamboo with notches about eight inches apart. From each notch spring a number of sharp leaves.

About fifteen months after planting the canes are ready to be cut. Before this is done, however, they are stripped of the sharp leaves which would otherwise injure the hands of the cutters. Sometimes the coolie women remove them with the aid of big knives, but sometimes the leaves are burnt off. As the canes are harvested in the driest part of the year the leaves

TEA AND SUGAR

are dry, and once the fire has been started great tongues of flame sweep across the plantation, destroying the leaves but, strangely, not injuring the canes.

The cutting is done by both men and women. They cut down the cane close to the ground, trim off any leaves that still remain, and frequently cut off the top notch also, for this, when planted, is found to produce the best sugar canes.

While the cutters are at work other coolies stack the canes on ox-carts or load them on trolleys that run on rails across the fields. The loads are drawn away to the factory where the canes are passed between heavy rollers that squeeze out the juice into a large tank. Lime is mixed with the juice, after which it is heated and evaporated until small crystals of sugar



Carts laden with sugar cane drawn by oxen.

[E.N.A.]

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appear. The sugar is separated from the syrup, or molasses, by passing the contents of the tank through a rapidly revolving cylinder. This works in the same way as the separator in a dairy. Out of one spout sugar crystals tumble into clean sacks while out of the other pours a stream of molasses which can be made into cattle food or rum.

EXERCISES

1. The chief tea-growing countries are mentioned in Exercise 2. Mark all these countries on a "Map showing where tea is grown."

2. Tea exported in 1933:

India	.	.	.	.	382	million pounds' weight
Ceylon	.	.	.	.	215	" " "
Java	.	.	.	.	165	" " "
Japan	.	.	.	.	95	" " "
China	.	.	.	.	92	" " "

What percentage of the world's exported tea comes from the British Empire? From which three countries do we import large quantities?

3. In Assam there are 930 tea gardens, giving a total of 400,544 acres of tea plants fit for picking. 527,500 people are employed and the total production is 225 million pounds weight of tea. How large is the average plantation? How many people are employed on each estate on an average? What weight of tea is produced from each acre?

4. The following table gives the chief sugar-producing countries and the weight of sugar that each grows in million hundredweights (the figures are for 1934).

Cane.		Beet.	
India	. . . 103	United States	. . 32
Cuba	. . . 46	Germany	. . 28
Philippines	. . 29	Russia	. . 22
Hawaii	. . 19	France	. . 19
Porto Rico	. . 18	Czecho-Slovakia	. . 10
Australia	. . 13	British Isles	. . 10
Brazil	. . 13	Poland	. . 7
Formosa	. . 13	Sweden	. . 6
Java	. . 12	Italy	. . 6
Other countries	. . 71	Other countries	. . 3·7

(a) What weight of cane sugar is grown in the two countries of the British Empire?

(b) How much cane sugar and beet sugar are produced in lands south of the equator?

(c) What fraction of all the beet sugar is grown in the British Isles?

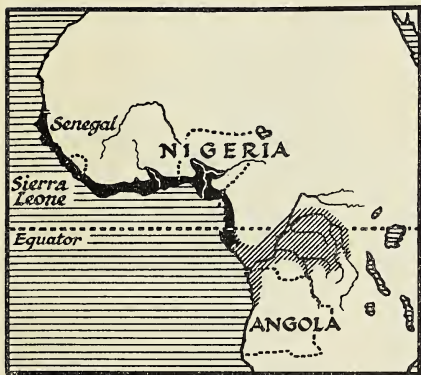
5. On a map of the world mark the regions that grow (a) sugar beet and (b) those that grow sugar cane. What differences in climate stand out?

6. On a map of England mark the counties that grow sugar beet.

7. Though India comes first on the list of sugar-growing lands, she does not export much sugar. Why?

CHAPTER 20

OIL FROM PLANTS



Map of West Africa, the black and shaded areas showing where the oil palm grows.

WE have learnt that man in the Old Stone Age collected wild fruits and seeds for his own needs. Let us look now at a native African tribe which collects wild fruits, not for its own needs, but to supply the white merchant with something that he requires.

All along the coast of Africa from Angola to Senegal there is a rather narrow strip of hot, wet forest, never more than two hundred miles wide. It is divided between a number of different countries, one of which is Sierra Leone.

Most of the inhabitants of the forested parts of Sierra Leone are negroes who live in clearings. They are farmers and grow their own food—rice, tapioca, plantains (a kind of banana), millet, and maize. They cultivate the soil with a hoe and manure it with the ashes of the trees that they burn down to clear the ground.

Because they are cultivators they stay at home. Their huts are much like those of the Kaffirs, made of sticks, plastered with clay, and roofed with leaves and grass. There are no windows

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or chimneys and the soot from the fire collects on the roof and hangs down like black icicles.

They have almost always enough food to eat, but they have



[From the Imperial Institute Collections.]

Climbing oil palms to collect the cones containing the fruit.

OIL FROM PLANTS

no surplus. As food growers, they are so unimportant that we need not bother about them. But there is in the hot, wet forest of West Africa a very valuable tree called the oil palm.

The palm is something like a coco-nut tree, but it bears large cones, each of which weighs about twenty pounds and contains several hundred fruits. To gather the cones a man climbs the palm with a cutlass between his teeth and a long stick ending in a chisel blade fastened to his side. When he reaches the top he slashes off the fruit near to him with the cutlass and attacks the distant ones with the chisel blade. The fallen cones are picked up and taken to the village, where the rest of the family open them and take out the fruit.

At the centre of each plum-like fruit is a nut with a hard shell containing the valuable kernel. Round the nut is a lot of oily pith and outside the whole is a tough skin. Both the kernel and the pith are wanted. To obtain the oil the fruits are first boiled in water, either in big iron cauldrons that have been bought from a trader or in earthenware pots that have been made at home. They are then emptied into wooden troughs and pounded with heavy wooden clubs. This breaks the outer skin, after which the nuts are picked out. The pith is then boiled again, when the oil rises to the surface and is skimmed off.



[Courtesy, Lever Bros., Ltd.]

Method of climbing the oil palm.

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[E.N.A.]

An oil palm bearing several bunches of fruit.

When the pulp has been dealt with the nuts themselves are prepared for export. Outside almost every hut during this season men, women, and children can be seen squatting in groups chattering and nut-cracking. The nuts are picked up one at a time, placed on one stone, and struck with another. Most of the kernels, however, are not crushed locally; they are sent to Europe.

The West African negro used the fruit of the oil palm long before he had ever seen a white man. The oil that is skimmed off the surface is eaten like butter, while the nuts are boiled to form a kind of soup. But he does little or nothing to grow fresh palm trees. There are so many of them that it is not necessary to plant others. At times, however, young seedlings

OIL FROM PLANTS

are transplanted in cleared ground because they can there grow more rapidly and the fruit be more easily collected.

At certain seasons of the year streams of black people can be seen hurrying along the roads, carrying on their heads sacks full of palm kernels and pitchers, rum bottles, and petrol cans full of palm oil. They are taking these things down to the rivers, which are the easiest way of reaching the coast and the white man's ships.

With the money obtained for the oil and the kernels they buy from the white man cotton goods, arms, tools, and other things which they cannot make for themselves. He in his turn uses the oil and the kernels in the manufacture of soap, candles, margarine, and "tin plate." Tin plate is thin sheets of iron coated with tin to prevent them rusting. Before the tin is laid on them they are covered with a thin film of oil, and much palm oil is bought for this purpose.



Natives cracking palm-oil nuts.

[Courtesy, Lever Bros., Ltd.]

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Notice that in the case of the oil palm it is Nature, not man, that provides the surplus. The black man collects it and the white man buys it. But this will not always be the case in West Africa. What will happen then? We may begin to get an idea from what we have learned about rubber, coco-nuts, and cocoa.

EXERCISES

1. On a map of the world, showing the chief climatic regions, mark all those that have the same kind of climate as West Africa. Make a list of the countries.

2. Draw a map of that part of Africa lying between the Tropic of Cancer and the Equator and west of longitude 10 degrees east. Insert the rivers Niger and Gambia.

Name, and draw thin lines to show the boundaries of, Nigeria, the Gold Coast, Sierra Leone, and Gambia.

Name and make little dots to show the position of Lagos, Accra, Takoradi, Freetown, and Bathurst.

Colour red those countries that are parts of the British Empire.

3. Another important West African oil nut is the ground nut or "monkey nut." The chief country to grow it is Gambia. Find out all you can about this nut and its uses.

4. Make a list of fruits or seeds that are sent to England to give oil to make margarine. Opposite each say from what country it comes and name one port from which it is exported.

5. An Elder Dempster steamer sails along the Guinea coast of West Africa and takes in cargo from several different ports and then sets sail for Hull.

(a) Name six ports at which you think she should call.

(b) Name four products that she is likely to take on board as cargo.

(c) Explain why vegetable oils and cattle cake are made at Hull.



Map of the world, showing the cotton- and flax-growing regions.

PART FIVE : TILLING THE SOIL FOR CLOTHES

I. Cotton

THE ground is cultivated to produce materials for clothes as well as for food; the chief clothing plants are cotton, flax, and the mulberry for silk. We have already spoken of silk in Book II and we shall have more to say about it and about cotton and flax in Book IV.

Of all materials used for making clothes cotton is to-day much the most important, for millions of people living in hot countries wear nothing else. The fine threads from which cotton cloth is made come from a plant that grows in many countries that have long, hot summers and a considerable amount of rain. The United States of America, India, and Egypt are the three most important countries, but in the last

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two the water is supplied, not so much by rain as by irrigation from rivers.

If the temperature falls a little below freezing point then the cotton plants are killed just as dahlias and some other English plants are nipped by the first frost of autumn. Cotton can only be grown, therefore, in regions where the summers are so long that the seeds can be sown after the last frost of spring and the harvest can be gathered in before the first frost of the winter.

The south-eastern part of the United States of America is far and away the most important cotton-producing region of the world. It is an almost perfect region for the cultivation of cotton—a splendid climate, a rich soil, and plenty of cheap labour. Here vast areas of woodland were destroyed so that the land could be tilled, and the region now supplies twice as much cotton as all the other places in the world put together.

This is another land where the labourers were, at one time, slaves from Africa. The weather in summer is too hot for white people to do hard work in fields, and, as we shall see presently, cotton-growing means a great deal of hard work. Nearly a hundred years ago all slaves in America were made free, but they did not go back to Africa. They remained to work, either as their own masters, or, mostly, as wage-earners on plantations. In the “cotton belt” of the United States there are now nearly as many negroes as there are white people. To save the wage bill and to get the work done as quickly as possible, most of the cotton planters use as much machinery as they can, but much of the work has still to be done by hand.

During the winter months the rich black soil is deeply ploughed. On small farms mules or bullocks may be used, but on the larger estates ploughs cutting three or four furrows at a time are hauled across the land by traction engines. After this is finished the clods are broken up by a harrow.

In early spring the soil is ploughed up once again and

TILLING THE SOIL FOR CLOTHES



[E.N.A.]

Negroes picking cotton.

chemical fertiliser is laid in the trenches. Still once more, for the third time before the sowing, the ground is ploughed; this time the plough share cuts along the ridges and turns the soil over to cover the fertiliser.

When April comes and there is little chance of any more frost, the seed is sown. Cotton seed is too expensive to be scattered broadcast over the fields. A drill is used and as it is drawn along seeds are flipped out through tubes into the furrows cut by the plough. A harrow rakes the loose soil over the seeds and then the planting is finished.

After about ten days the young seedlings begin to appear and with them a host of weeds which must be uprooted with a hoe or by a machine which sweeps the soil round the stems of the plants. Every two or three weeks this hoeing must be repeated until the plants are fully grown.

The cotton plant is a bushy shrub with a bud at the end of each twig. The bud opens into a white flower which turns

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Weighing baskets of cotton on a plantation.

[E.N.A.]

pink. After four days the petals fall. Then the seed box, or *boll*, grows larger and larger and finally bursts open. Each of the many tiny seeds is surrounded by a number of very fine hairs, about an inch in length. This is the cotton wool from which our cotton clothing is made. When the bolls burst the plant looks as if it were covered with snowballs or powder puffs. Unfortunately they do not all burst at the same time, and three pickings must be made to gather in all the cotton.

Picking has to be done by hand and generally begins in August. Machines have been invented, but they are very costly and do not do the work very well because no machine can tell which bolls are ripe and which are not. Whole families of negroes, clad in highly coloured cotton clothing, pluck the fluff from the shrubs and place it in a kind of bag that hangs at their side. While the many pickers are at work the overseer rides up and down on horseback to see that the work is being done properly. As the bags are filled they are emptied into

TILLING THE SOIL FOR CLOTHES

great wicker baskets. At the end of the day the baskets are weighed and the labourers are paid according to the amount of cotton they have gathered.

The negroes work speedily to earn good wages and to gather the whole crop before the first winter frost. The work is usually finished by the end of November or early in December; the pickers draw their wages and have a merry Christmas.

The wicker baskets contain both cotton seed and cotton fluff and these have to be separated. Years ago the small seeds were picked out by hand, but now this tiring work is no longer needed; machines, called *gins*, have been invented that do the work more cheaply, much more quickly, and just as well. The planter sends his pickings to the ginnery where they are put through the machine. The fine cotton wool is then packed in canvas under great pressure so that each package weighs nearly a quarter of a ton. It is now ready to go to the cotton mill to be spun and woven into cloth. The seeds are not wasted: some are saved for the planter to sow in the following year; the remainder are crushed to make oil, and the refuse is used as cattle food.

2. Flax

We have said that cotton is, to-day, the material most widely used in the manufacture of clothes, but that was not always the case. Before the invention of the machines for spinning and weaving that caused cotton goods to become so cheap, linen, made from the fibre of the flax plant, was the most important material. The cultivation of flax for its fibres is very old indeed and goes back, in Europe, to the days of the New Stone Age. In the remains of houses built by men of the New Stone Age, near the shores of the lakes in Switzerland, have been found lines and nets for fishing and catching animals. These were made from flax fibre as were also the cords and ropes that were in use.

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Flax drying in a field in Belgium.

[E.N.A.]

In ancient Egypt linen clothing was worn, and the wrappings round the mummies were also of linen. Pictures on the walls of ancient Egyptian tombs show the way in which linen was prepared from flax in those long-ago times. The use of linen for clothing spread, later, all over Europe, for the flax plant will grow in Europe and the British Isles. The peasants could thus grow their own flax and make their own linen goods, and there are still places in Central and Eastern Europe where linen goods are made in old-fashioned ways. Every year, however, fewer and fewer people weave linen cloth by hand. The hand-made linen was very strong and often lasted a lifetime.

The flax plant can be grown either for its seed (linseed) or for its fibre. When it is grown for its fibre it needs a rather moist soil. It can, therefore, be cultivated in the wet soils of northern and western Europe. Some of the best linen in the world comes from Belgium and Northern Ireland.

To grow flax of good quality the land must be very carefully

TILLING THE SOIL FOR CLOTHES

prepared to make the soil as fine as possible. When the plants are about two to three inches high, the fields must be weeded by hand. The weeders move slowly, on hands and knees, facing the wind, and try to grub up every weed so as to leave all the food in the soil for the use of the young plants. The plants are pulled up before the seeds are ripe and left on the fields to dry.

The fibres are the part of the plant that is used. To obtain these they must be set free from the woody centre of the stalk. How this is done by machinery will be told in Book IV. At one time it was all done by hand. When people made linen for their own use the time and labour did not matter very much, but to-day, when linen is made in factories and wages have to be paid, linen costs so much that it is not as widely used as in former times. People who can, however, afford the cost, still prefer linen for sheets and tablecloths because of its smooth and shining surface.

EXERCISES

1. Choose two important cotton-growing regions and two flax fibre-growing regions. Make a table for each showing the temperatures and rainfall throughout the year. What do these tables tell you about the needs of the two plants?
2. On a map of the world mark the chief cotton-growing regions and show, by arrows, the routes by which the cotton is exported. Mark by dots the towns importing raw cotton. (Consult a commercial geography.)
3. The following table gives in thousands the number of white and negro people living in six States of North America:

	Whites.	Negro.	Number of negroes to 1,000 white people.
Alabama	1,448	900	
Tennessee	1,886	451	
Texas	3,922	742	
Mississippi	855	935	
New York State	10,187	198	
Louisiana	1,098	700	

Five of these names occur frequently in coon songs. Why?

Complete the last column of the table. Which of these States have more than ten white people to every one negro? Look at your map and try to explain the reason.

4. On an outline map of the United States on which the States are shown, name and colour the States in the cotton belt.
5. For what purposes other than clothing is linen used to-day?
6. Mark on a map of Europe the regions where flax is grown for fibre.

A LAST WORD ABOUT CULTIVATORS

IT will be well, at the end of this book, to bring together some of the most important things that we have learnt about those who till the ground.

As we have seen, in the case of Egypt, Iraq, and China, the knowledge of how to grow grain for food led men to higher and better ways of life. But, as some of our chapters have shown, tilling the soil has not, everywhere, brought such happy results. The cultivators may be living in a land which is not easily reached by men from outside and so do not get news of other things that can be grown or of better ways of growing the plants which they use.

The Kaffirs who now cultivate maize, the West Africans who now cultivate cocoa, and the Indians who now grow tea were more fortunate. They have learned from other races. In no case, however, could these plants have been grown by them if the climate had not been suitable. There is always the climate to think about. Sometimes it helps, sometimes it hinders, and sometimes it prevents any form of agriculture at all.

In the Arctic regions nothing grows. In lands like Russia winter cold puts an end to plant growth for three to six months every year. In lands such as Egypt, India, and Iraq, there is warmth and sunshine all the year round, so that plant growth need not stop so long as there is sufficient water.

In India, for many, many years, the tiller of the soil was always likely to suffer from drought either because the monsoon rains did not fall or the rivers that obtained their water from melting snows did not rise. The farmers tried to provide water for irrigation by digging wells and making tanks, or reservoirs,

A LAST WORD ABOUT CULTIVATORS

but there were not enough of these and, in bad years, there were famines that often caused thousands of deaths.

The British, however, who have done so much for India, have now made great dams to hold up water and hundreds of miles of canals to carry it to the fields when it is needed. These canals not only help in times of drought, but bring silt to fertilise the soil. From the Ganges, no fewer than 1,200 miles of main canals, with 6,500 miles of smaller channels, have been built. There are other networks of canals and ditches in the Punjab, Sindh, and the Deccan. One of the greatest irrigation dams in the world is that built by the British at Sukkur in Sindh.

The great wheat-lands in the United States of America, Australia, and Russia also suffer, at times, from drought. The rains, for no reason that man can as yet foresee, fail and the crops are ruined.

On the other hand, crops sometimes suffer from too much water. The farmers in China, near the Hwang-ho, and those in the United States near the Mississippi river often see their farms drowned and their crops destroyed because the river has risen suddenly and flooded the land.

Next we may call to mind the great changes that have taken place in farming since the invention of machinery, the increase in the number of large cities all over the world which, more and more, depend on food from far-off lands, and the newer, better, quicker, and cheaper ways of carrying things from place to place. All this has led to farming on a large scale, that is, to the cultivation of vast areas by means of machinery to provide large quantities of food for export.

It has also led men to make large plantations of trees and shrubs bearing fruit and berries. These plantations, as we have shown in the case of bananas, tea, cocoa, coffee, and oranges, are worked in many different ways.

At first there was always a market for the things that were

THE CULTIVATORS

grown on a large scale, so men went on planting wider and wider areas with just one kind of crop—wheat, rubber, coffee, and so on. Then it was found that more of any one of these things was being grown than the rest of the world was ready to buy and the farmers actually burned or destroyed great quantities of their crops because they could not sell them.

The farmer has always had his troubles—drought, too much or too little rain, river floods, frosts, and insect pests. Now he has a new one: he does not know if there will be a market for his crops when he has gathered in the harvest.

One way by which he tries to mend matters is not to give up such a lot of ground to one crop only. He is beginning to take to mixed farming again. This is interesting because it is the plan by which the British farmer, who works on a small scale (see Chapter 11), tries to meet the uncertain British climate.

Another point to notice is that the large-scale farms were made in countries where there were few people and land was cheap. On such farms, though great quantities are grown, the amount raised, per acre, is small. The farmer thinks more of quantity than of quality, and machinery is more important than human skill. This kind of farming is called *extensive* farming.

But in lands like China, where there are millions upon millions of people, and there is very little land to spare, men try to obtain as much as ever they can from each little plot. Here the amount raised, per acre, is very high. Quality is the important thing and human skill and human labour are more important than machinery. This kind of farming is called *intensive* farming.

One kind of intensive farming, called market gardening, has grown with the growth of the towns. Market gardeners raise crops that will not keep long—lettuces, cabbages, strawberries,

A LAST WORD ABOUT CULTIVATORS



[E.N.A.]

A swarm of locusts in Algeria. These pests will eat every particle of green where they settle.

raspberries, and the like. They must be near enough to a big town to allow them to sell their crops in the town markets while they are fresh.

Lastly we may point out how science now tries to help the cultivator. In many parts of the world there are special colleges and special farms where men study the lives and habits of plants and the way in which they thrive or fail in different kinds of weather and soil. When they have found out anything that they know to be useful they tell the farmer and the peasant. They supply good seeds and teach good methods.

Science is also trying to help by studying the best ways of

THE CULTIVATORS

packing, grading, and marketing what the farmer grows. Even in a long-settled land, like Britain, with all its old ideas and ways of doing things, new ways of cultivating and new ways of marketing are being planned. The latest example of this is the growing of fruit and vegetables for a home-canning industry.

In this book we have seen people at work in their own land and also working far from their homes, in the most important task in the world—the growing of food. In the next book we shall look at the life of the peoples who depend on the world's farmers and see how they earn the money to purchase the food they no longer grow for themselves.

EXERCISE

1. Ships reach British ports from Singapore, Lagos, Rangoon, Kingston (Jamaica), Demerara (British Guiana), Calcutta, Colombo (Ceylon), New Orleans, and Santos.

The chief cargoes unloaded are rice, bananas, cotton, rubber, sugar, coffee, palm kernels, coco-nuts, and tea.

Make a list of these products and opposite each write the names of the ports at which the products were loaded.

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